
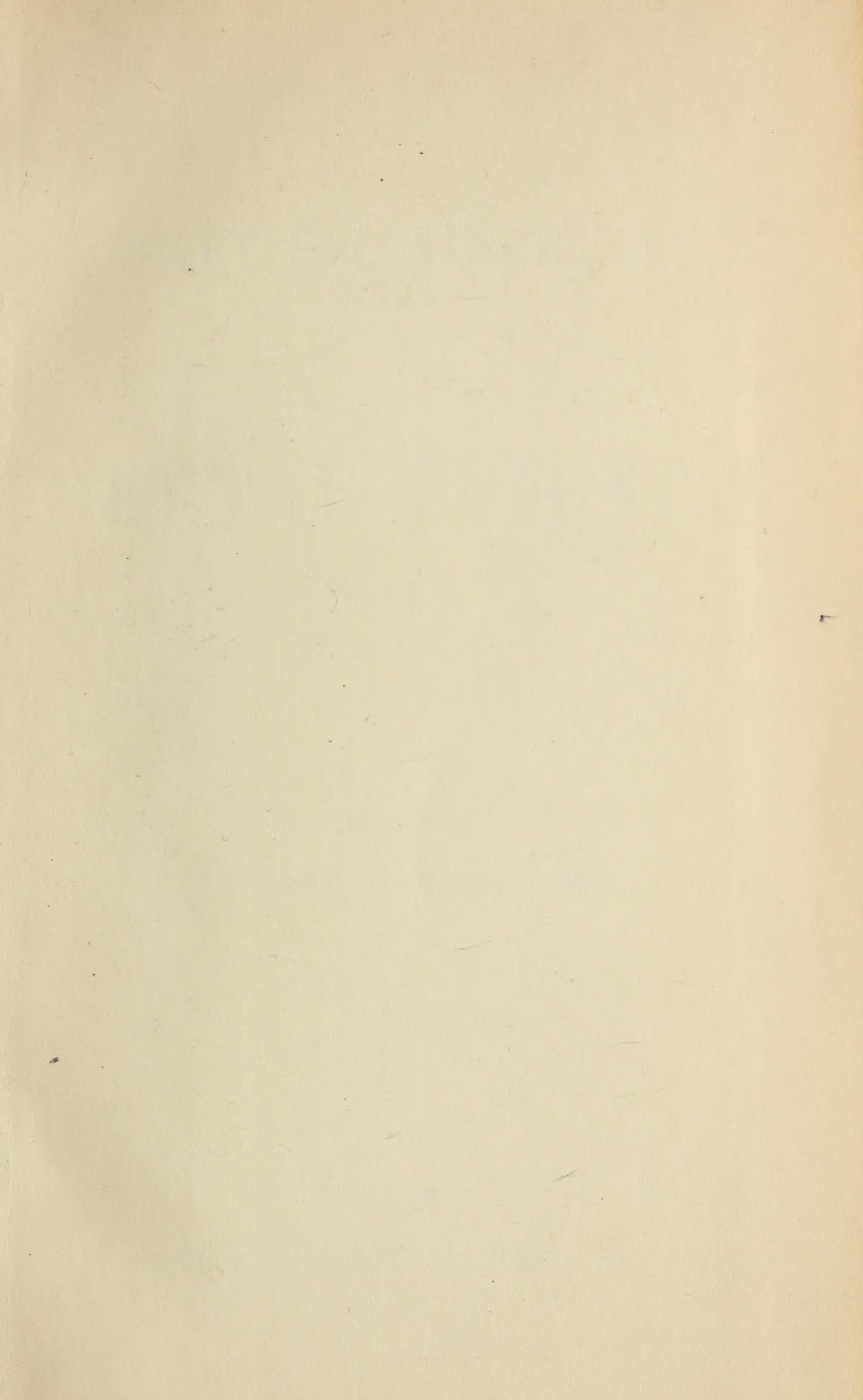




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THE DEVELOPMENT, FORMS, STRUCTURE, AND MODES OF ATTACHMENT OF TEETH, HUMAN AND COMPARATIVE.*

By JOHN W. DUNKERLEY, Esq., L.D.S.I.

(Continued from page 1123.)

Plate 10. Is an original drawing which exhibits this development of the enamel organ, showing that the cord dips inwards from the free surface of the epithelium; and you will notice some of the epithelium cells falling into the centre of the cord. The point I wish to lay stress upon is that the cells of the infant layer are not columnar at first, as shewn in Mr. C. Tomes' Dental Anatomy,* page 120, Fig 58, (which is however a copy from Frey's Histology) but oval or spheroidal. They afterwards become columnar. At the bottom of this ingrowing sac active cell multiplication takes place, as is figured on the screen. The multiplication of cells is found to be in the outer infant layer of the rete-Malpighi. The walls of the cord are composed of the infant layer of cells, while the centre is afterwards filled up with the older cells which have been pushed off from the sides as development of the enamel organ is enlarged.

I will also show on the screen by means of drawings and micro-photography other specimens, illustrating the development of the teeth, both human and comparative, and their different modes of attachment. Attachment by an elastic hinge is well illustrated by Lophius, and also in the Pike which shows a remarkable difference in its dentition.

The mouth of this fish is crowded with sharply pointed teeth, greatly varying in size, which incline backwards and inwards. The largest of the teeth are of formidable size and are on the margins of the lower jaw. The smallest teeth are situated in the front part of the mouth; the upper teeth being

* Delivered before the Manchester Odontological Society.

in the intermaxillary bone, and the lower in the corresponding part of the mouth. The margins of the upper jaw are destitute of teeth except the above mentioned intermaxillary. In the roof in the mouth of the Pike there are three distinct bands of teeth, each band being composed of several rows. In a specimen where the mouth is five inches long, the centre (vomerine) band is three and a half inches long. This band commences in the front of the mouth, with a transverse row of eight teeth, and gradually tapers to a point. These teeth are directed backwards, and are all moveable in only one direction backwards and slightly outwards. The outer bands are situated on the palatine bones, and are broader than the vomerine, but not quite so long. These teeth move backwards and inwards only. The outer median rows are the largest, each successive row being a little shorter. The lingual bone, and the three median bones behind it, carry teeth arranged in long patches. The internal surfaces of the branchial bones are also armed with fine, strong and sharp teeth. In structure these teeth are composed of an outside layer of dentine, the central body being osteo-dentine, through which in the hinged teeth run a number of very fine elastic cords. They originate on and are attached to the subjacent bone, where they first form a united strong band, eventually sending off numerous branches as it ascends upwards through the osteo-dentine; and these delicate cords become attached to different points internally. This mode of attachment to the subjacent bone is distinctly shown by the micro-photograph which I now throw upon the screen. I call especial attention to this matter because the mode of attachment here shown is not in accordance with what we have been taught. The tooth also has a distinct hinge, the elasticity of which is perfect, but allows the tooth to be moved in one direction only, whereas if the elastic cords are cut, the tooth will stay in any position it may be placed. The teeth at the sides of the jaws give a perfect example of attachment by Anchylosis. The osteo-dentine with which the teeth are filled up, becomes continuous with the subjacent bone, and cements them upon it.

In other animals, as the Python, there is a special layer of bone which closely embraces the tooth. The bone is very coarse in texture, full of irregular spaces, and if the tooth is lost it also is removed, although it is quite distinct therefrom. (Plates 27 and 28). The teeth of the Python consist of a body of firm dentine coated by a layer of cement, which is

extremely thin upon the crown, but is thicker towards the expanded and attached base of the tooth. The intermaxillary bone supports four teeth, the superior maxillary eighteen teeth, the palatine bone six teeth, and the pterygoid bone supports eight teeth, and the lower jaw carries eighteen teeth. The teeth are slender, conical, and suddenly bent backwards and inwards above their base of attachment; and are slightly longer in the front than in the rear. The upper maxillary of the python exhibits two rows of teeth on each side. The two superior maxillary bones have their anterior extremities joined by an elastic fibrous tissue with the small and single intermaxillary bone. The symphyseal extremities of the lower maxillary are connected together by a similar tissue. The posterior extremity of each ramus is articulated to a long and moveable bone, the quadrate bone, which is attached to the extremity of a horizontal pedicel formed by the mastoid bone. Thus the maxillary apparatus is conformably and peculiarly modified to permit the animal to swallow other animals larger than itself.

Plate 29. In the poisonous rattle-snakes, vipers, &c., the poison fangs acquire their largest size, and are associated only with their successors; which are closely set in the mucous membrane of the mouth, and present the same structure, but of a smaller size according to their development, and differ in being loosely embedded in the thick or wide mucous gum, which at the same time conceals the fixed and functionary fang when not in use. This fang is more strongly curved backwards than the ordinary teeth. The teeth in the lower maxillary are very small compared with the poison tooth. The mechanism by which the poison fang is erected is best described by Professor Huxley.*

“When the mouth is shut the axis of the quadrate bone is inclined backwards. The pterygoid, thrown back as far as it can go, straightens the pterygo-palatine joint, and causes the axis of the palatine and pterygoid bones to coincide. The transverse also carried back by the pterygoid, similarly pulls the posterior part of the maxilla, and causes its proper palatine face, to which the great channelled poison fangs are attached to look backwards. Hence the fang lie along the roof of the mouth, concealed between the folds of the mucous membrane. But when the animal opens its mouth for the

* (Anatomy of Vertebrate Animals, page 241).

purpose of striking its prey, the digastic muscles, pulling up the angle of the mandible, at the same time thrusts the distal end of the quadrate bone forwards, which pushes forward the pterygoid, the result of which is twofold ; firstly, the bending of the pterygo-palatine joint ; secondly, the partial rotation of the maxillary upon its lachrymal joint, the hidden edge of the maxillary being thrust downwards and forwards. In virtue of this rotation of the maxillary about a quarter of a circle, the dentigerous face of the maxilla looks downwards, and the fangs are erected into a vertical position. The snake 'strikes' by the simultaneous contraction of the crotaphite muscle, part of which extends over the poison gland. The poison is injected into the wound through the canal of the fang, and this being withdrawn, the mouth is shut, all the previous movements reversed, and the parts return to their first position."

The poison fang is exceedingly sharp, its point being continued a little below where the poison canal opens on the front of the tooth. The dentine is continued down to a very fine point, and is capped only by a very fine layer of enamel which covers the whole exterior of the tooth. When the tooth is lost, it is succeeded by another upon the vacant spot by its side, so that the places are alternately occupied by the tooth in use. The reserve poison fangs, as many as ten in number, are likewise arranged in two parallel series, in which the tooth exists in pairs of equal age ; the tooth in use being alternately derived from the one, and then the other series. This arrangement keeps the animal always supplied with one organ in a state of efficiency. The poison is secreted by a salivary gland homologous with the parotid, by a special arrangement of the muscles ; when the poison fang is erected, the infliction of the bite causes a copious stream of poison to be ejected. The passage of a large amount of the poison down the tube is secured by a fold of mucous membrane, which is strained over the erected tooth.

I will now explain the structure of the poison fang. First, we have a simple layer of enamel, then dentine, then a pulp cavity which distends itself about two-thirds of the tooth, inside of which we have another layer of hard dentine, which separates the pulp from the poison cavity.

Plate 37. I wish here to say a word or two upon the number of the teeth in the Crocodilian species. The species and genera differ from each other in the number of teeth as

displacement is constantly being carried on during the life of the animal.

In their development, the teeth of fishes are formed more or less like the teeth in the mammalia, but the process in many instances does not extend beyond the earlier and simple stages observable in the higher classes of animals. In all fishes, the first indication is the production of a simple papilla from the free surface of the soft external integument, or the mucous membrane of the mouth. In many fishes, such as the pike, the dental papillæ become buried in the membrane from which they arise; and the surface to which their bases are attached become the bottom of a closed sac. This sac is never lodged in the substance of the jaw; but the development of the tooth is completed in the tissue of the thick and soft gum, or mucous membrane, from which the papillæ were originally developed. So that the teeth in various stages of growth are brought away with that membrane when it is reflected from the jaw bone. The teeth so formed are ultimately fixed by the development of ligamentous fibres in the submucous tissue between the jaw and the base of the tooth. The fibres become the medium of connection between those parts, either by continuous ossification, or as elastic ligaments.

In the Bream tribe of fishes (sparoids) and others the formation of the teeth present all the usual stages which have been observed to succeed each other in the dentition of the higher organized animals. The papilla soon becomes surrounded with a capsule, and is then included in a closed alveolus of the growing jaw. The enamel organ is developed from the inner surface of the capsule which surrounds the bone pulp; and this enamel organ terminates the same as in the human subject. The formation of the enamel resembles more closely that of the dentine in the fishes cited than in the mammalia.

In the sharks and all those fishes in which the teeth are completely formed without going beyond the papillary stage of development, there is no distinct enamel pulp. The dense exterior layer of the tooth is formed by the calcification of the membrana propria of the pulp, which precedes the formation of the ordinary dentine.

In the Rays the development of the teeth may be studied with very great ease; inasmuch as teeth from the primitive papilla stage to the perfectly developed and fully formed

tooth, may be obtained in the same specimen. In the *Ray Vulgaris*, in which I have had the pleasure of showing the development of the teeth, I find that the dental papillæ do not sink deep into the substance of the vascular membrane from which they grow, but are slightly buried in the thick fibrous tissue; overlapping which, is an opposite fold of membranous tissue. The dental papillæ are at first very minute specks, of an oval appearance. In their development they do not elongate like the human papillæ, but seem to swell, or bulge outwards from the sides, remaining rather flat upon the surface. At the same time the fibrous membrane in which the germs are developed is continually moving forwards, so that the dental papillæ, by the stretching of the fibrous membrane upwards and on to the maxillary, throws the dental papillæ on to the surface where for a time it remains in a depression. The pulp substance, or contents of the capsule, remains for a period in a fluid state. In this fluid a number of granules, having a nucleus, are first developed; float in the fluid, and when a considerable number have been formed, they become attached in clusters, and finally anchor themselves to the inner surface of the cap. It is at this stage that the papilla has risen to the level of the membrane, in which it was buried. The pulp now continues to develop in thickness; and soon rises above the surface and swells to its full dimensions; and the whole of the contents of the growing pulp becomes soon after of a firm consistence by the numerous additional granules which are rapidly developed in it. After it has become permeated by capillary vessels and nerves, the fibres of the dentine are first observable in transverse section at the crown of the young tooth, more especially at its labial and lingual surfaces. The ossification of the dentine is continued in concentric layers, until the whole of the tooth is completely developed. The teeth of the *Ray Vulgaris* are continually being formed from behind, and come into use as the teeth are worn out in front. The jaws in transverse section are pear-shaped, so that in actual use when the mouth is closed, only a small portion of the teeth come together; but by means of a rolling motion of the jaws from front to back a considerable number of teeth can be brought into use. The teeth are smaller in the lower, and are more square in the middle line than in the upper, maxillary; and the lower teeth at the sides of the jaws are larger than in the upper pavement, where they are very small and closely

packed together. Each tooth is compressed at the sides of the base, forming a short but firm fang ; and there is also a groove at the apex of the fang, giving an appearance of a diastrophic tooth, which allows of it being firmly held in the thick membrane of the mouth.

The teeth when rising on the lingual surface of the jaws are somewhat lapped over each other ; but when brought into use the appearance is altered. The crown as erupted is diamond shaped, slightly convex above, with a slight undulating ridge ; but is soon worn flat, until the remains of the old pulp cavity can be seen. The membrane continually moving forward throws off the teeth as they are worn out. The microscopical structure of the teeth exhibits a modification of the tubular system. This is best seen in transverse sections, where the tubes are seen radiating from small canals which arise from the base of the tooth and at their terminations inosculating with the branches of others. It is known as plicidentine. As regards their microscopical structure, the teeth of the Rays are most beautiful objects to look at.

In all fishes, the teeth are shed and renewed during the whole lifetime of the animal. In all cases where the teeth are developed in alveolar cavities those succeeding follow them in the vertical position, and are developed from the mucous capsule of their predecessors. But in the great majority of fishes, the germs of the new teeth are developed from the mucous membrane of the mouth throughout the whole period of succession, which ends only with the death of the animal.

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- | | | |
|-----|--|------------|
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| 10. | " Enamel Organ | Original " |
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CLEFT PALATE.*

By W. J. FISK, L.D.S. Edinburgh.

Mr. President and Gentlemen.—When I first purposed reading a paper on the subject of cleft palate, it was my intention to devote most of it to the details concerning its mechanical treatment so important to the Dentist. I find, however, the matter too vast a one for treatment in a proper manner with other parts of the subject, so will, with the kind permission of the society, devote at an early date a paper exclusively to the mechanical treatment of congenital cases, and going, at the same time more fully into the construction of modern appliances, their adaptations, and the power they have of improving the voice, which is one of the chief reasons for treatment.

I hope at the same time to give results obtained by the use of hard and soft obturators, and also the effect of after-training. The present paper will therefore only be a summary of the subject, which is one perhaps too little noticed by us, for the reason that it is generally considered to be outside the requirements of every day practice; or rather, with greater reason, through lack of opportunity in seeing the treatment of those cases, mechanical or otherwise, the matter being very rarely demonstrated during the student's career.

The term "Cleft of the Palate" or "Fissured Palate" is applied to any fissure in the hard or soft palate, or in both, and may be classified under two headings, viz., Congenital or Acquired. The former includes all those deformities which may be noticed at birth, and the latter those cases in which there has been loss of tissue either hard or soft, through disease, inherited or acquired. These deformities may be further sub-divided; the cleft may run through the uvula alone, or through the uvula and soft palate, through the soft palate and part of the hard, or may extend through both soft and hard palates and alveolus, the last variety being almost always associated with single or double hare-lip. In cases of this description the vomer may be seen presenting a free

* Read before the Students' Society of the National Dental Hospital, of London.

border, or else attached to one of the margins of the cleft. In the museum of the Royal College of Surgeons may be seen a specimen in which there has been no development of the intermaxillary bones, and thus producing fissure in the lip and alveolus, in the median line.

The direct cause of cleft palate is due to arrested development; a consideration of the facts connected with the formation of the upper jaw will make this clear. Both upper and lower jaw make their appearance about the twentieth day of intra-uterine existence, as little buds from the first visceral arch, and grow inwards towards the median line; those which form the lower jaw reach the middle line and there coalesce; those for the upper jaw (called the superior maxillary processes) stop short, and the gap left between them is filled up by a double downward sprouting of the fronto-nasal process from the forehead, which afterwards becomes the inter-maxillary bones. If the superior maxillary processes do not unite with the superficial portions of the naso-frontal process; either one or both, the result will be either single or double hare-lip.

Non-union of the superior maxillary with the inter-maxillary bones, will cause single or double alveolar fissure, if the arrested union is uni-lateral or bi-lateral. If the palatal plates of the superior maxillary bones do not themselves unite, we have the true cleft-palate as the result. It is therefore certain that the arrest of development occurs before the end of the second month of intra-uterine life, and no cause which comes into activity after that period can have any influence on the production of the deformity.

The effects of this deformity are principally defective speech and impairment of the functions of deglutition and mastication. The variations in vocal sounds which give rise to speech, are not produced in the larynx but in the throat, mouth and nose; it is obvious then, that any deficiency of the parts entering into the formation of these cavities must modify the power of voice production.

In the act of deglutition the soft palate is raised, and the opening between the pharynx and posterior nares is closed, thus preventing the food from entering the nose. But when a cleft exists in the soft palate, deglutition becomes difficult, for by the contraction of the muscles of the pharynx, part of the food is forced into the nose.

A question to be solved is—What are the conditions neces-

sary to bring about the arrested development? Many explanations have been made. Hereditary influence is a theory which is argued as an explanation; yet against it we can say that numerous cases of cleft palate exist (perhaps the majority) in which no history of the deformity can be traced in either the ancestors of the patient or collateral branches.

In the cases I have come across personally, I could not trace in any single instance the deformity to any past or present connections of the family. Mr. Oakley Coles thinks that hereditary influence is an indirect factor, and in his work on deformities of the jaw gives instances where the deformity has existed in more than one member of the same family. This is evidence, no doubt, but yet not sufficiently strong to warrant us in accepting heredity as a solution.

Kingsley puts it very briefly; his opinion is that cleft-palate is due to an arrest of development the causes of which are unknown. There has been some evidence that the deformity was inherited, but even if such cases were traced back through the ancestry until we arrived at the initial we should still be at a loss to account for the first arrestation; on the other hand, by far the larger majority of cases seem to be free from all hereditary taint, and are isolated cases in the family. It is not confined to any class or condition of life, and like other departures from a normal type, examples may occasionally be found amongst the most cultivated and purest blood, but by far the greater portion is to be found in the lower walks of life from the poorly nourished and physically depraved.

In the case of some Lion-cubs born in the Zoological Gardens with cleft palate, evidence points to change of diet being the chief factor; for, both in Dublin and London, after the substitution of small animals which they can eat bones and all, for the flesh of the larger, cleft palate among the cubs became very rare. Thus the change of diet had a most marked effect, although of course it may have been only a coincidence. It would, however, be interesting to obtain statistics showing the present proportion of cleft palate cases in animals leading an artificial life, for until we have them, we cannot accept this diet-theory as conclusive evidence.

Dr. Langdon Down considers that there is a constant relation between malformation of the palate and defective cerebral development, and gives statistics the result of which go to show that these views are well supported by careful observation.

A high state of civilization may be another factor, for in the 200 ancient skulls examined by Messrs. Cartwright and Coleman in the crypt of Hythe church, they had, without exception, perfectly developed maxillæ and well-developed alveolar arches. Mr. Mummery made a much more extensive examination of ancient skulls with the like result.

Dr. Nicholls, of New York, after an investigation of thousands of Indian and Chinese skulls, states that the jaws of both races were unusually well formed and completely developed. These experiences are confirmed by the state of the skulls of other races who have not been brought under the influences of modern civilization.

It is an undoubted fact that a physical deterioration takes place in individuals, the progeny of town-dwellers, and that the present conditions of life in our large cities favour this deterioration. Take for instance, the operation of extraction among the well-to-do classes, and those who belong to the orders living under the most unhealthy conditions, it is a comparatively simple matter; perform the same operation for the country labourer, or individuals who lead an out-door healthy country life, and what do we find? Why, that we are dealing with quite a different type of jaw indeed, for instead of a simple operation, it becomes a difficult one, even at the hands of a most expert operator.

I only mention this as an illustration for the purpose of showing the effect produced on the physical conditions of the individual by his surroundings. Taking the statements of Messrs. Cartwright, Coleman, Mummery and Dr. Nicholls, and contrasting them with the opinion and statistics of Dr. Langdon Down, the inference is that a high state of civilization may have something to answer for in the causation of the deformity.

The treatment of Cleft palate, may be either surgical or mechanical; the former being entirely a matter for the surgeon, and quite outside the dentist's province. The fissure is treated by an operation perfected by Sir William Ferguson. At one time it was exclusively applied to adults or younger persons who could endure the pain and assist the surgeon during the operation. Since then, by the introduction of the Smith gag, and the use of anæsthetics, children of tender years are operated upon before they have acquired the habit of imperfect articulation. Three or four years is the age generally selected, an earlier period not being favourable owing to

the hæmorrhage being severe, and there being a much greater risk of non-union of the wound in consequence of the numerous disturbances of health to which very young children are particularly liable.

I now purpose giving a short extract from a paper by Sir William Ferguson, written in 1844. He had had the good fortune to meet with a case of this deformity in the dissecting-room and took an account of it for his subject matter. This paper was a most important one, for in it he formulated his views as to the anatomy of the parts, and based his method of treatment for this condition, putting forward his plan of dividing the levatores palati muscles in order to prevent tension on the sutures.

We will now imagine that we are looking into the mouth of a patient suffering from cleft of the soft palate.

“As we look into the open mouth the flaps may be seen under four different conditions. First.—If the parts be not irritated in any way the gap will be quite conspicuous, the lateral flaps will be distinct, and the posterior nares with the upper end of the pharynx will be observed above and behind. Second.—If the flaps be touched, they will in all probability be jerked upwards by a motion seemingly commencing at the middle of each. Third. If the parts be further irritated as by pushing the finger against them into the fissure, each flap is forcibly drawn upwards and outwards, and can scarcely be distinguished from the rest of the parts, forming the sides of the nostrils and throat. And fourth, if the parts further back be irritated as in the second act of deglutition, the margins of the fissure are forced together, by the action of the superior constrictor muscle.

“All these conditions and movements are in my opinion very readily accounted for. In the first instance the parts may be deemed in a quiescent state ; in the second, the levatores palati are called in to play, and move the flaps as described ; and in the third, those muscles act still more forcibly and the palato-pharyngei will join in drawing the parts outwards. The fourth condition I need not again describe.

“If the free margin on one side of the fissure be seized with the forceps, drawn towards the mesial line, and the flap be then irritated it will be drawn upwards and outwards with remarkable force : this movement, it is evident can only be effected by two muscles, the levator palati and palato-pharyngeus. These muscles then I consider the chief mechanical

obstacles to the junctions of the margins in the mesial line. Hitherto, I have taken no notice of the action of the circumflexus, or tensor palati. I am inclined to think that its action is very limited, and probably is greater upon the parts outside the posterior pillar than on those contiguous to the fissure. Neither have I alluded specially to the action of the palato-glossus, because though it might with a feeble power incline the soft palate downwards its influence, as regards the practical view I am now taking, is completely counteracted by the more powerful muscles connected with the palate above."

Sir William Ferguson subsequently treated from three to four hundred cases, and the results confirmed him in the opinion that success depended mainly upon the division of the levator and tensor palati muscles.

Briefly described, the operation for closure of the soft palate is performed as follows:—The edges of the cleft are pared from below upwards, the uvula, and the lower part of the palate, are then united with horsehair, the upper part with silver wire, when the parts are brought together the tension is relieved by making lateral incisions through each side of the soft palate, thus dividing the levator palati muscles. The palato-pharyngei may if necessary be divided by notching the posterior pillars of the fauces. Before Sir William's time, the operation failed owing to the tension on the sutures by the levator muscles preventing union; we can then fully appreciate his skill in overcoming this difficulty.

Surgeons seem to favour an operative as against a mechanical treatment; we must remember however, that they probably are not aware what art can do when skilfully applied. Having so few opportunities of seeing cases which have had the best possible mechanical treatment we, as dentists have something to answer for, and it is to the dental profession that surgeons will look for mechanical treatment in these cases. If the statistics are not good owing to indifferent work resulting from imperfect knowledge, their opinion as to the assistance that dentists can render them, will not be a favourable one.

These patients suffer much, and feel acutely their affliction; mechanical dentistry should do much for them. Does it do its best? That is a question, gentlemen, for your consideration this evening. That the power exists, a study of the literature on the subject will testify what some earnest men

have been able to accomplish ; and we also are aware what individual members of the profession can, and do, do, in rendering mechanical assistance. I consider that every candidate for the Dental Diploma should be signed up by the lecturer on mechanical dentistry for at least one case of congenital cleft palate treated correctly. It is a question of vital importance to the sufferer, and is even of much more than the mere saving of his teeth from disease.

Kingsley thinks that the operative treatment is only justified in those rare cases of slight separation, and with an abundance of tissue, where the division of the levator palati would not, necessary to success, or at a very early period of life when we might expect that as the organs developed in tissue, function, and activity, the defect would be overcome. His objection to the operation is because the newly formed septum is rigid, tense, and deficient in length, in the large majority of cases it cannot by any possibility be brought into contact with the pharyngeal wall. Thus imperfect speech will always follow the defect.

He also holds strongly to the opinion that much can be done by artificial means, and that mechanical treatment as against surgical will give better results. It would be interesting if gentlemen would give results of cases, coming under notice from time to time, to enable us to decide whether surgical or mechanical treatment was the more satisfactory. Decidedly, for my own part, I would in the case of an adult feel inclined to favour the insertion of an obturator or velum.

In mechanically treating the hard palate we have this advantage—we are dealing with a fixed structure so different to the conditions met with in treating the soft palate. In the operation the edges of the cleft are pared ; an incision from $\frac{1}{4}$ to $\frac{3}{4}$ of an inch long is made on each side through the muco-periosteum down to the bone ; it is then separated from the bone along the whole length of the cleft in the hard palate, and the muco-periosteal flaps thus made are brought down and united in the middle line.

Sir Wm. Ferguson introduced an operation in which instead of paring the membrane off the bone, he divided the latter with scissors in the line of the incision made near the alveolar border, and then the whole portion of the cleft bone and all is displaced to meet its fellow of the opposite side, which is treated in the same way ; the edges are then pared, and sewn together with sutures. The mechanical treatment consists in

the insertion of instruments into the mouth, which either simply cover the deficiency or are partly moveable, for example a velum, or are fixtures which the parts move upon, such as a Suersons obturator. Mechanical treatment dates from the 16th century, when it was proposed to close the aperture either by wax or sponge. Various methods were advocated until 1820, when a distinct advance was made by the adoption of elastic gum as a case for the restoration of the parts.

The first recorded case in which an accurate model was taken for the purpose of adopting an obturator was Mr. Snell's in 1828. In 1845, Mr. Stern constructed an instrument which from its action was most probably based on the movements of the soft palate described by Sir William Ferguson in the previous year. Kingsley introduced to the Odontological Society, after an interval of twenty years, a method which was thought highly of by his colleagues. The instrument was constructed somewhat on the lines laid down by Stern, but a special feature was the use of plaster-of-paris in taking the impression, and metallic moulds in which to vulcanize the elastic velum. Since then he has modified his obturator to a much simpler form, and at present treatment by the use of the Kingsley obturator is considered to be one of the most desirable methods.

Mr. Sercombe, in 1857, in a paper read before the Odontological Society, described his method of treatment, which consisted of two pieces of vulcanized india-rubber, the larger piece extremely thin, and the smaller much thicker. These two pieces were sewn to the posterior margin of the gold plate which was perforated for this purpose. More recently Mr. Oakley Coles has contributed largely to the knowledge possessed in the treatment of these cases.

Dr. Suerson, at a meeting held by the central association of German dentists at Hamburgh, in 1867, described an obturator which possessed features unlike any which had been previously known, and for which he received their gold medal. Many others have contributed to the list, but those mentioned are among the best known.

As the terms "velum" and "obturator" may cause one to get a little mixed, I will give Kingsley's definition, which I imagine may be accepted as official:—An obturator is a cover or plug, non-elastic and stationary fitted to an opening, with a well defined border or outline, and shutting off the passage, for example, hard rubber and the Suerson Obturator.

A velum is an elastic moveable valve under the control of the surrounding muscles closing or opening the passage at will, for example, the Kingsley instrument, made with soft rubber. Before constructing either a velum or obturator, it is well to become familiar with the anatomy of the parts, and especially with Sir William Ferguson's description of the action of the muscles entering into the formation of the soft palate, before quoted.

The velum made by Kingsley, and used with such success, consists of two flaps connected together; in between the laminae, the two halves of the uvula approach each other, the nasal flap is carried upwards by the action of the levator muscles, and the posterior border comes into contact with the posterior wall of the pharynx when in action. The principles which govern the velum are that it should be lifted up by the muscles, and also bridge the upper pharynx behind the uvula, and cut off nasal communication at will. The palatal flap to this velum has no movement.

The first thing necessary is to obtain a good impression of both palates using an ordinary tray, and from the model obtained a special tray should be made; thoroughly adapted to both hard and soft palate, and with this a second impression should be taken in plaster. It is important that the soft palate should be taken in its *relaxed condition* with the entire borders of the fissure from its apex to the termination of the uvula, this being all that is required in the greater majority of cases. When, however, the floor of the nares is required for the support of the case, it is necessary to have a more extended impression.

This is done by filling the cavity above the roof of the mouth with soft plaster down to the border of the fissure, and whilst soft carrying the palatal impression already taken against it, letting it remain until the plaster has set. The surfaces of the palatal impression should be first painted with some non-adhesive compound, to prevent adhesion with the plaster above the margins of the cleft. On removing the tray the nasal portion will be left; this can be removed with a pair of suitable tweezers, moving backwards and downwards.

For some time before making the final velum, the parts should have been trained to the presence of a foreign body, by having had a plate with either a tongue or else a small velum in contact. After making the model, the next step

is to form the velum in either wax or gutta-percha. After finishing and deciding as to its form, it is to be duplicated in soft rubber.

It is cast in plaster either in two or three parts ; and afterwards again in type-metal, zinc, or tin ; and in these latter the rubber is vulcanized.

The Suerson obturator is quite different in action to the Kingsley ; it takes advantage of one action of a muscle (the superior constructor of the pharynx) which before had received no attention in connection with voice obturators.

Dr. Suerson, in speaking of this instrument says :— “ In order to be able to pronounce all letters distinctly, it is necessary to separate the cavity of the mouth from the cavity of the nose.

That separation is, under normal conditions, effected on the one hand by the velum palati which strains itself (consequently by the levator and tensor palati), but on the other hand, also, by a muscle which, to my knowledge has, in connection with these operations, not yet received a sufficient amount of attention, I mean the constrictor pharyngeus superior. This muscle contracts itself during the utterance of every letter pronounced without a nasal sound, just as the levator does. The constrictor muscle contracts the palati-pharyngeus, the pharynx wall bulging out, and it is chiefly on the action of this muscle that I base the system of my artificial plates.” These plates are made with hard rubber, which is not in any part moveable, so that the surrounding parts move upon it; in Kingsley’s instrument you will remember the nasal plate was moveable, and worked with the muscles. I am of the opinion that in this instrument we have a most valuable appliance for the treatment of many cases of congenital cleft-palate. Through Dr. Suerson’s kindness I am enabled to submit one of his obturators which fully illustrates his method. You will notice that it consists of a plate, and terminates in a large process which fills up the cleft. It is of such a thickness as to maintain contact between the sides of the process and the two halves of the velum.

Now when the sides of the soft palate move upwards, they at the same time go outwards ; now as contact with the sides of the process is essential to success, they are made to rise obliquely outwards, so that in the movement of the soft palate, the sides are in contact with the broad edges of the process. The lower surface of the latter turned towards the

mouth, lies on about a level with the velum, if it is raised by the levator muscles when the velum is hanging at rest, the back part of the palate is lying over it. The back portion partly fills the pharyngeal cavity, but in such a manner that it is not in contact with the superior construction when out of action, therefore there is a free passage of air, and the patient can breathe through his nose.

Now when the superior constrictor contracts, as it does in the utterance of every letter excepting M and N, the bulged out portion reclines against the posterior vertical wall, thus separating the nasal from the oval cavity. The nasal surface of an obturator of this description should be grooved and highly polished. I have great faith in this obturator, and have seen results obtained equal to any, by the aid of a velum. Kingsley would advise that it be worn secondary to a velum, I have, however, seen them inserted on a first instrument, and there was no reason to show that anything would have been gained by fixing a velum in the first instance. In forming the instrument, the plate should be made with a prolongation back into the cleft, on this should be modelled a mass of gutta-percha filling the cleft, and the patient should be directed to swallow immediately, and frequently thus exposing the gutta-percha to the pressure of the constructor muscles after trimming away the excess of material, it should be gradually reduced until there is no pressure of the surrounding parts upon it, but simply slight pressure.

The result can now be duplicated in rubber after the usual method, and although from its size, we might expect a heavy instrument, we can get over the difficulty by filling the bulk with cotton wool, cork, or by distending it with steam during the process of vulcanising.

The defects of the palate arising from accidental causes are almost always due to the effects of syphilis. The extent of the destruction of tissue may be limited to a small perforation in either the hard or soft palate, or may involve the whole of the soft or hard palate and alveolus with the surrounding structures. The obvious result is that the patient loses the power of proper articulation, deglutition is impaired, and where the soft palate is involved, fluids readily escape through the nose. A more distressing condition can hardly be imagined, and any means whereby the patient's numerous discomforts may be lessened, should command our utmost attention.

Fortunately, in very many cases a great deal can be done by mechanical treatment to lessen the symptoms which make life a misery to the sufferers from this deformity. We have this advantage in treatment, that, prior to the destruction of tissue, the patient had the power of correct articulation, and therefore, we have only to replace the parts that have been lost in order to successfully restore to him the functions before interfered with.

In this respect it differs greatly from the treatment of a person who has been afflicted from birth and who has never been able to acquire the faculty of correct speech.

Kingsley points out the difference very concisely when he says :—"In acquired lesions even crude appliances made without much skill or accuracy, are often very beneficial whilst in congenital cases the full resources of science and the nicest adapt ability of art are needed to accomplish the desired result."

A very common form of deformity is a perforation of the hard and soft palate. These perforations are usually oval in shape and occur in the median line. Then cases are found where the posterior part of the soft palate or even the whole of it has been lost. The necrosis is sometimes confined to the inter-maxillary bone involving the loss of the front teeth and alveolus. Of course the loss of tissue may be of more or less magnitude ; unfortunately it is at times very extensive, but still, we may take these classes of cases as typical of accidental lesions, for the principles we shall apply in their mechanical treatment are applicable to all these conditions of the palate where there has been destruction of tissue from disease.

One rule we must always adopt in treating the perforation of the hard and soft palate, when it is caused by ulceration the tendency is for the parts to grow together, and thus the opening gradually becomes obliterated, and that is —never insert any plug into the cavity, on the one hand it prevents the closure of the opening and the pressure will have a tendency to enlarge the margins. It is not at all an uncommon occurrence to see an opening in the palate enlarged in this manner. A case is recorded by Kingsley where the patient had closed a small perforation of the hard palate with a wad of cotton the swelling of which enlarged the opening and necessitated a still larger plug until the entire roof of the mouth and teeth were carried away, leaving but a narrow rim along the alveolar border.

All that will be necessary in a simple perforation, is to make a palate in metal or vulcanite, which will cover the opening ; it is to be so constructed that it covers and protects, but does not encroach upon the margins of the gap, the surface of the plate coming next to the opening must be highly polished, so that no chafing may take place ; to sum up your treatment, is to cover over the gap, preventing meanwhile, any irritation to the parts. You then improve the articulation, and offer every inducement to the parts to come together. Examples can be quoted where these openings having been covered over with a plate, the aperture has eventually become closed.

Mr. Oakley Coles advises that the plate in these cases, should be made of pure uncoloured rubber, in order to avoid any possibility of injurious effects arising from the colouring matter used in the manufacture of the ordinary coloured rubber. After fixing a plate, instruct the patient to report immediately there is any irritation ; if the plate is the cause it can be easily remedied, should it arise from other sources, the patient should be seen at once by a surgeon. Inattention to this does much mischief, as the result might be ulceration and loss of tissue, which taken in time could probably have been prevented.

I can call to mind a case which occurred in the provinces some time ago under my own observation. A patient, who had been wearing an ordinary denture seemed to be suffering from a sore throat, and on examination the soft palate was found to be inflamed. The true cause was unfortunately not diagnosed, but the case was treated by the dentist as an ordinary instance of inflamed throat. He used various astringents as local applications until to his surprise he realized, when about a good portion of the palate had sloughed that the correct thing would have been to send the patient to a surgeon to be treated for syphilis.

I simply mention this incident for the purpose of showing the importance that dentists should place in cases where any suspicion may arise as to the exact nature of the symptoms exhibited. In this instance it would have been of immense advantage to the patient if the dentist had confined himself to the comfort of the denture and then sent her to a surgeon for treatment.

In openings into the soft palate it is sometimes desirable to use soft rubber to act as a hinge ; thus the plate would be made of hard rubber, then soft rubber at the posterior border

with hard rubber beyond to cover the perforation ; a margin of about $\frac{1}{4}$ of an inch external to the opening will be about the required size, the hard and soft rubber could be vulcanizable.

In destruction of any portion of the soft palate, where any tissue has been left behind ; it is desirable to take advantage of it in order that the naso-pharyngeal cavity can with the assistance of a velum be separated at will from the mouth.

In a case of this kind, the first thing necessary, is to educate the parts into tolerating the presence of a foreign body. This should be done by making a prolongation backwards as far as the patient can bear with comfort, and gradually increasing this prolongation until contact with the pharynx gives no irritation.

Where the loss had been, I would cover the margin of the cleft with a single flap velum, the margins should be fitted to within one-sixteenth of an inch round the sides, and from about one-eighth to one-fourth of an inch at the portion coming in front of the posterior wall of the pharynx. This would allow of a space between the walls of the pharynx, and thus prevent any undue accumulation of mucus ; at the same time the muscles of the pharynx will in contraction come in contact with the margins of the velum, and thus close the naso-pharyngeal cavity.

I should say, gentlemen, that we cannot in all cases fix a velum which we think is best for the patient. We know how difficult it is sometimes with artificial dentures. Some patients can wear a plate with comfort, the size of which if worn by others could not be tolerated.

Again, the contact of a plate on the gum will sometimes cause a considerable amount of pain, and we are all familiar with the patient who so frequently requires a case eased, whilst yet another will tolerate almost anything.

So it is with obturators, one patient will wear a velum which it is desirable to use, and good results will follow, whilst another is able to wear nothing but a very small one, where a large one is necessary.

All we can do after deciding as to the proper shape of the instrument is to work up to it. If the velum causes irritation, reduce it in size until it can be borne : two or three months after insert a larger one, and so on until it becomes impossible for your patient to wear it larger, or till you have attained the size necessary to give the best results.

In taking impressions of the mouth where perforations exist, I think it is only necessary to cover the opening with gold-beaters skin. Plaster or any of the ordinary compositions may be used, where much of the soft palate has been lost, I find plaster to be the best material.

In preparing the plate the velum can be modelled in gutta-percha or wax, to the size and shape required; if any curving be necessary, thicken it in parts which will keep it in the proper position. In forming the edges, we must remember the parts with which it is liable to come in contact, and must therefore have the margins neither blunt or stiff, but feather edged.

After modelling, fix it *in situ* on the plate, which I assume has already been prepared, try it in, and trim it freely if irritation is produced, as it is an easy matter to make a larger one later on. Finally trim it, and cast in plaster in two parts which must be afterwards duplicated in type-metal, tin or zinc. If zinc be used, the part which forms the velum, should be faced with tin. In all cases that portion of the casting must be made smooth: the margins may be slightly rubbed down, which will give you the feather head before mentioned.

Before packing the mould with velum rubber, wash them thoroughly in hot soda and water, as perfect cleanliness is necessary. When dry spread a slight film of soap over them, and pack quickly, remembering not to make the metal or rubber very warm, but only to increase the softness of the rubber used; clamp up and vulcanize. To obtain the best results vulcanize for six hours, (two hours at 240, two hours at 250, and two hours at 260.) The plate to carry the velum should be made in the ordinary way; if teeth be absent they can be fixed on the plates. It will only differ from an ordinary denture in having a prolongation backward with either one or two pins to carry the velum. Trim the velum with a sharp pair of scissors and make a continuous cut round, it will give you a better edge, whereas short cuts in trimming leave a very rough one.

In this paper I cannot lay claim to much originality, but would like to remark that I was led to take an interest in these cases by the fact that I had the advantage of being associated for some time with a gentleman who made the treatment of cleft palate somewhat of a specialty, and who was also very successful in his results.

Englishmen, I fear, do not take a very prominent position in this matter, as at our College examinations when asked to describe the proper method to be adopted in such a case, we have to quote as our authorities either an American or a German in its origin. I sincerely trust that at no very distant date, a method fathered by a British practitioner shall equal, if not eclipse its foreign rivals. I must confess that I should like a little more attention to be given to this course of study, for it is greatly to the disadvantage of English Dentistry when we are aware that very many practitioners object to undertake a case of this description, owing to a false idea that they are too difficult. Some doubtless are very complicated, but the average case is well within the scope of any dentist, and all that is necessary is an application of the knowledge obtained during the career of the Dental Student.

PHOSPHATE OF ZINC CEMENT AS ANCHORAGE FOR PERMANENT FILLINGS.*

BY C. F. PETERS, D.D.S., Syracuse, New York.

ABOUT six years ago I read a paper before the Syracuse Dental Society, on the subject "Oxyphosphate" in which my main object was to bring forward the idea of its use as anchorage for amalgam fillings in particular. After the experience I have had with the method, I have nothing to retract, but can reiterate with emphasis every word said then. This, now, is no new untried thing I bring before you. For the last two years it has been talked of more or less throughout the country. I conceived the idea early in 1884, when a lady came to me for treatment, in whose mouth were four teeth which two years previously she had been told were beyond saving, but had neglected having them extracted on account of the dread of the operation. I treated three of these teeth and filled the roots, but could think of nothing that would be retained in the crown but cement. I wondered if amalgam would stick to cement as the cement does to tooth structure.

I tried it and was successful, and those three fillings are in to-day and can be produced at any time. The good results

* Read before the 5th District Dental Society of the State of New York.

attending its use with amalgam suggested at once numerous uses to which it might be put as anchorage for gold, foundation for any other filling at one operation, lining for thin walls where objectionable colour of filling material could show through, cementing fillings which had fallen out or loosened intact, last, to place temporarily or otherwise. As an anchorage its greatest is, I believe under amalgam fillings in cases of badly broken down molar and bicuspid crowns, where, on account of excessive decay and nearness of the pulp reliable undercut cannot be obtained, and if it could be, would so weaken what remained of the crown as to deprive it of strength to carry the filling. It is especially useful in molars where the buccal surface, and a half, or more, of the grinding surface is gone, in bicuspids whose proximate surfaces are gone with a large share of the grinding so that the opening of the cavity is the full size of the circumference of the tooth and the remaining walls thin. It is astonishing how many of these latter cases can be shaped and contoured with amalgam, without a particle of the amalgam being in sight after the work is finished. If in an anterior proximal filling, proper contouring make it necessary for some of the amalgam to show the anchorage, may be thoroughly relied on to permit of cutting out a small portion and facing with gold.

The shading of the thin walls by the amalgam is absolutely prevented by the cement. I have in my own mouth a molar in which the filling was loosened by mastication five times on account of the cavity being one of the kind where reliable anchorage could not be obtained. The pulp finally became exposed from frequent cutting away of tooth structure, and the sixth filling was anchored by taking advantage of the pulp chamber or a portion of it.

To use cement as anchorage for amalgam--this is the process :—Mix the amalgam according to your custom, place on a slab for mixing cement, a small quantity of the liquid and powder ready to mix, then the cavity being prepared, dry it thoroughly and keep it so while mixing the cement. This being done, place a small amount in the cavity and at once upon it place a piece of amalgam which should be so manipulated with the instrument suited to the size and shape of cavity, as to force the cement under the amalgam all over the floor of the cavity. Care should be taken not to force the cement entirely to the cervical edge in proximal

cavities, and any excess of cement used, should be worked out at a point easy of access. By this time the cement is hard enough to be easily chipped off wherever it has been forced beyond the inner edge of the enamel.

The filling with amalgam is proceeded with and finished in the usual manner.

It is essential that the cement should not be smeared over the edges of the cavity, but carefully worked all over the dentine, closing the mouths of the tubuli, allowing the enamel edge free for contact with the amalgam. The edges of such a filling are better, and remain better than those of the ordinary filling for the reason, I believe, that the cement controls, or at any rate lessens the spheroidal tendency in the amalgam. In very deep cavities it is well to work into the cement a piece of hardened amalgam before inserting the fresh as it lessens the amount of cement necessary, and also of the amalgam, and again prevents the tendency to spheroid.

Proximal cavities in children's teeth are very easily filled with amalgam by this method, and without causing pain in cutting tooth structure. We now come to the use of cements as anchorage for gold. With this material it has a smaller field of application, and in my hands does not yield as good results as in the use of amalgam.

I believe Dr. F. D. Nellis, of Syracuse, New York, was the first to conceive the idea, and use the cement as anchorage for gold.

It is useful in teeth having very shallow cavities and in those cases where, while it is desirable to use gold, the edges chip or shale off at every attempt to make the cavity retentive. The method of use is as follows:—The rubber dam of course is used, the cavity being ready, a small amount of cement is mixed and placed in the cavity. On the cement put a cylinder of gold large enough to cover the floor of the cavity. Work the gold into the cement at the same time working the latter all over the cavity. Trim cement from edges and proceed with the filling, making a mechanical anchorage of the gold with that anchored by the cement. Foil or pellet may be used in place of cylinder and it may be cohesive or not and the filling finished with soft or cohesive gold, but I think the best results are obtained by using soft cylinder over the cement, continuing with the same and finishing with a few strips of annealed foil. A very good way is to proceed to fill the cavity with gold the same as if cement were not to be

used for anchorage, holding the gold in place with another instrument and when sufficient has been inserted to nicely take the form of the cavity to takè out, place a little cement in the cavity, then force the gold back to place and after waiting a minute or two for the setting, go on and finish the filling. It is not necessary in this work to confine oneself to the use of the phosphate of zinc cement. In restoring colour to very dark pulpless teeth and wherever extra whiteness is desired the oxy-chloride may be used with advantage, but must not be relied upon for strength like the oxy-phosphate. In shading I get the best general results from the yellow shade of the latter. Pulpless teeth generally have a bluish tinge and yellow seems to neutralize it very effectually. In regard to the effect of oxy-phosphate in deep cavities in teeth with living pulps, it does not seem necesssary for me to say much here since the subject has long been worn thread bare by the profession.

However, it must be borne in mind, that here is a difference, the cement in the use I have described is sealed away from the fluids of the mouth, and does not have the same effect as when being disintegrated by these fluids. It remains perfectly inert substance so long as moisture is kept from it, and has the same use in the floor of the cavity as the varnish so often recommended for closing the tubuli of the dentine to prevent ingress of moisture from that direction.

In such cases, it is a very simple matter to touch the bottom of the cavity with liquid gutta-percha before using the cement. In cases of exposure when capping is desired, cap according to your custom, and then proceed as described. Where extirpation is resorted to, I fill root and pulp chamber with gutta-percha.

CARCINOMA OF THE UPPER LIP.

DR. ESCHWEILER (Deutsch. Zeitschr für Chirurgie, vol. xxix.) has gathered statistics relative to the frequency of this lesion. The cases which he had observed or collected are 66 in number. It is much less frequent than cancer of the lower lip (1 to 17 of the latter): more frequent in men than in women (37 to 24). It occurs oftener upon the left than the right side, and oftener among working people than the leisurely classes.

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A RETROSPECT AND A FORE-CAST.

AROUND the beginning of a new year hangs a sort of old-world romance, which, neither this most prosaic nineteenth century, nor the matter-of-fact period of life, at which most of us have arrived, has altogether obliterated. Although, probably, none of us are able to turn over an entirely new page in the book of life, nor to begin all things entirely afresh, as that chubby round-faced little boy, whom dear old Mr. Punch introduces to us year by year, is supposed to do ; yet we are not able quite to get rid of the idea of making a new start with the new year. We, as it were, take stock of the year that is gone, sum up its successes and failures, and, then blotting out the latter, hope to carry on and renew the former. We do this of our private and our professional lives ; as well as of our pecuniary matters.

Thirty-three years have passed away since we, the Journal, first were launched on our career. Issue by issue, we chronicle the doings, the sayings, the writings of the Profession. Much is but reiteration. Men write to-day, as original, much that was written, and, perhaps, better written, (who knows !) before they were born. Yet this is not waste, for, apart from the fact that we are all of us apt to forget, new men are continually coming into the Profession who knew not of the old writings. But there is a forward movement. Hidden away, may be, in a lot of verbiage, like the pearl of great price amongst much rubbish, some fact is stated, some idea

is mooted, some invention is explained, which, growing, becomes of great moment in our daily work. So, then, a retrospect is not without interest, nor a look-a-head devoid of use.

In the life of a profession, a year is but a little time, and few are marked by great events. The year that is gone can scarcely be regarded as one of these. Fads and fancies have come and gone. Ideas and methods, heralded forth as panaceas for all the troubles that dentists have to cope with, have been taking their place, not at the head of, but among their elder brethren, each of which is serviceable in its own sphere of use, but not being *the treatment in each and every case*. Hypnotism, the rage of a month, has dropped back again to its place amongst the curiosities. Dr. Mesmer, in his day, was a man of much account, the sought after of beauty and of fashion, but his day was short, and ere long he quitted his spacious halls not to return. So of Hypnotism. Cocaine, too, which was to have replaced general anæsthetics, is taking its place as a useful drug, but not to the exclusion of others. And the same may be said of many methods, of Bridge-work, of Implantation, and of what-not besides.

Then there has been the discussions raised by the report of the second Hyderabad Chloroform Commission. Chloroform kills by respiratory failure, said it, and immediately a great multitude arose, and vociferated that this was the opinion they had held for years, the symptom they had always paid special attention to, almost to the exclusion of others. Curious this, when any discovery is made, any new opinion expressed, immediately this same crowd stands up and shouts with a loud voice claiming "priority." Notice it in Koch's cure for tubercle and in much else. But as the year rolled along, the advocates of "cardiac failures" have reasserted themselves, so that, as is most commonly the case, a compromise has been made, opinion now holding that sometimes one and sometimes the other may be feared and should always be guarded against in Chloroform anæsthesia. Men are prone to dogmatise, but if pressed hardly with keen argument,

usually hedge, and settle down in stern neutrality, a condition they describe as "keeping an open mind": but which is more often evidence that their mind is more full of the proverb, "in medio tutissimus."

The great meeting of the year was undoubtedly the Berlin Congress, at which, once again, Dental Surgery was allotted its place amongst the various sections of the healing-art. Here, in spite of some personal piques, indulged in by certain members, and imagined slights, with regard to the proportion of papers allotted to the different nationalities, much useful work was done, and a stimulus given, it is hoped, to dental professional life in Germany.

We know of no great epoch-making paper read or written during the year, unless Dr. Miller's on the "Comparative value of Antiseptics," can be classed as such. Undoubtedly, this writer's work on "Micro-organisms" is the most important addition to Dental literature that the year has seen, though a new edition of *Tomes' "Anatomy,"* follows close with its call for mention.

In the Schools the work goes forward, and undoubtedly, the most important step was the formation of a mechanical department at the Dental Hospital of London. We must regard this a distinct advance. Viewed either from the standpoint of the poor, who find in hospitals the care they need, or from that of the student, who is too apt to look down on mechanics, forgetful that though a man may have the conceptions of a Michael Angelo, yet, if he have not the mechanical skill to put them into form, these will be but barren fancies dying with his own imaginings. Two schemes started with the close of the year, impart to it an importance, it were otherwise bereft of, and at the same time carry us over to the New Year. The first affects the Profession directly, it is the idea started by Mr. Morton Smale for a direct representative on the Medical Council. We may justly claim to have been the first to give public utterance to the idea, and as such we

take pleasure in watching over it and commending it to our readers so that, when the time comes, they may be prepared to help, either by their votes or by using their influence with those who have votes. The second affects the Profession through the schools, it is the decision arrived at by the Managing Committee of the Dental Hospital of London, to open its doors during the afternoon ; this will need an addition to the staff of Surgeons at that Hospital, which, however, though of sufficient importance to the successful candidates, whoever they may prove to be, is, of course, subsidiary in importance to the benefits likely to accrue both to the public and to the Profession, through its students, by the increased accommodation, and scope for work, which this extension of hours will afford. It is an open secret that the number of students of this institution and of the National Dental Hospital have almost increased beyond the accommodation available, and that the number of patients have shown a still more striking increase. The expedient mentioned above will undoubtedly relieve the immediate pressure on the former institution. It will be but for a time, and before long undoubtedly the call for a new building worthy of itself and of the profession will arise.

How stands the Profession at large ? The advance made in twelve short years, since 1878, has been rapid and marked. It would be unreasonable to have expected to find all the old abuses and advertising quackery swept away in so short a period even if the " Dental Act " had been perfect, which it was far from being. But, nevertheless, a more wholesome tendency is apparent and though much might be better, we still hope on.

Abroad the profession advances. In Italy we have a Dental Act. In France an agitation for one, and much discussion on rival schemes. In Germany the profession is attracting the attention of the authorities, and practical evidence is being given that the public weal demands that the right to practise should be safe-guarded. In the Austro-Hungarian Empire, we note the establishment of Dental departments at both the

Universities of Vienna and Buda-Pest. In Canada and in Australia schools and regulations have also been framed, whilst in New Zealand the first prosecution under its Dental Act has taken place. Last, but not least, it is with infinite pleasure that we record that the Profession in the United States is waking from its lethargy, and endeavouring to brush away many of the cobwebs of abuse which had o'er-grown it, the abuse of the patent-laws, the selling of the diplomas by bogus colleges and others. Finally, we may note as curious that, whilst the States may perhaps be looked upon as the home of the idea that dentistry is a profession *sui generis*, not a branch of medicine, the authorities, for taking the Census in that land, have been doubtful whether to call it a profession, a trade, or a manufacture, and by adopting the latter have given much umbrage. Verily! a prophet is without honour in his own country.

Apropos of a donation towards the Church Army scheme for Darkest England, an evening paper states that one of those recently helped was formerly a dentist in Hanover Square, and through drink and gambling had become a wreck in society." This is of course very sad, and the "Army's" kindness very laudable, but the picture of former affluence evidently intended to be conjured up by the description may be a little bit faulty. Hanover Square has, of course, seen dentists both eminent and wealthy, but it has also seen many who were the reverse. Quite recently a counsel in a breach of promise case described a man, or rather a boy, who to our personal knowledge is only a pupil of two years' standing, as an "eminent dentist." These descriptions should always be taken "with a grain of salt."

THE next meeting, in 1893, of the International Medical Congress is to be held in Rome. It is unfortunate that this should clash with the great world's fair at Chicago, at which it is proposed to hold a Dental Congress. It is rather outside

our sphere to comment on the above, since we have no doubt our American friends will be quite equal to attending and saying something at both, but at the same time it must be robbed of its International character ; since the meeting at Rome certainly has the prior claim and most of us will hardly be able to spare the time to attend both.

THE following peep at dental matters in Germany is interesting, it was given by Dr. Miller at a banquet in his honour at Philadelphia. "In 1869 a law was enacted in Germany which in effect entitled anyone to practise medicine or any speciality of medicine without any qualification whatever. While this law did not affect the practice of medicine, it had a marked effect upon the practice of dentistry. A class of "teeth-artists" appeared, who entered upon the practice of dentistry from the stand-point of the mechanic. At the present time, while there are not more than one thousand qualified practitioners, there are four or five times that many who have no qualification except such chance information as had been picked up. Some of these men become skilful in mechanical directions, and compete successfully with men who graduated from dental colleges. It is only within recent years that dental students received instruction in practical dentistry. Formerly they were launched upon the world utterly unprepared, and therefore the "teeth-mechanics" were able to compete with them. This has had the effect of stimulating the dentists to better qualify themselves for intelligent practice. Of course many German dentists made for themselves enviable positions in practical so well as in scientific dentistry, although the mass of the profession was in practical dentistry far below the standard reached in America.

MOST of us have wondered as to the cause of the increased price of Platina. It is apparent that it must be due to one of two reasons, either a diminished output at the mines or to increased consumption by various industries. We have pro-

bably been more inclined to look upon the former as the operative cause, but a conversation narrated in the "Exchange suggests, and with seeming probability, that the latter is the true solution of the difficulty. "No enterprise in the world," runs this paragraph, "has increased within the last few years as rapidly as the business of electric lighting. The amount of money invested in electric light in this country (United States) to day is 120,000,000, dols. and it was only eleven years ago, that the light was first perfected. From the few lamps burned by Edison at Menlo Park, in 1879 there have grown into present use at least 125,000 arc lights and 1,700,000 incandescent lights. Every lamp requires a strip of this metal (Platina). There have been a good many experiments for the purpose of determining a substitute for platina, but none has been found, the experiments resulting, in each instance, in the unequal expansion of the metal and the glass, and the consequent breaking of the globe." Electricity has certainly conferred many a boon on us dentists, but it certainly seems as if we had to pay for it in more ways than one.

A RICH quicksilver mine is said to have been found at the little market town of Wippach, Carinthia, Austria. So long as twenty years ago children, while playing near the Wippach at low water, had been known to find the metal. Little attention seems, however, to have been paid to the circumstance until the recent visit to the neighbourhood by a mining engineer. The metal is found at a depth of only three feet, so that mining operations could be prosecuted on the surface. The discovery of quicksilver at so slight a depth is phenomenal, the metal being usually found in old geological formations.

WE read, also, a curious tale of a mine of beeswax found in Oregon. It occurs on the beach near the mouth of the Hebelem. Some pieces have been uncovered and then washed ashore by the sea, but there are spots, "where the sea has never reached in the memory of the oldest settlers, and which

are covered with a good sized growth of spruce where deposits of wax may be found by digging. Several tons have been unearthed, and one man shipped a large amount to San Francisco once, for which he received 500 dols. In quality it is as good as any in the market, and has retained its familiar odour through all its rough usage and age. It is stated that it came from the wreck of a Spanish vessel or a Chinese junk over a century ago." These traditions in regard to the wrecks come from the Indians, and are not reliable. Mythical as it reads, the story of the beeswax is said to be true.

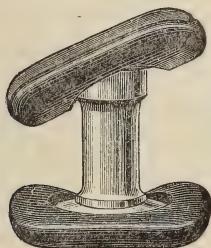
HERE is a new use for carbolic acid, about which M.R.C.P. Lond. writes to the *British Medical*. In my travelling bag I habitually carry a small bottle of carbolic acid, on account of the torment which a chance flea inflicts on me. If attacked, I take two or three pieces of waste paper, and upon each put a few drops of the strong acid, then roll them up and place them in different places around me in bed. This effectually ends the annoyance. I think the pungent "disinfectant" acid is the most effectual."

THE Government of Burmah has lately published an interesting report by Mr. Merrifield on the prospects of planting in Mergui, in the extreme south of Tenasserim, in the course of which he corrects the common error that the black teeth of the Malays and Siamese are due to chewing betel mixed with lime. It appears that the black colour of the teeth is due to a special process employed for the purpose; for no respectable Siamese would like to have white dogs' teeth, like Chinese, Indians, and Europeans. Cocoanut kernel is carefully charred, and then worked to a stiff paste with cocoanut oil. When carefully and regularly worked over the teeth, this produces the black varnish which is so much admired. Among some Malay tribes it is considered the proper thing not only to blacken the teeth, but to file them down to points like shark's teeth.

Manipulative Miscellany.

All new instruments or articles that it is wished to have described under this heading, are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

DR. HEWITT'S MOUTH GAG.



Messrs. Ash send us a sample of this gag, which has been designed by the above anæsthetist. It is difficult to explain its form in writing, this will be better seen from the block. It may be said to be a section of a wedge the sides of which are hollowed out to give lightness and room for operating. The advantages are: its strength, it would be almost impossible to break it; the breadth of biting surface, the pressure being spread over many teeth, not concentrated on one; one is sufficient for all purposes, if the patient's has a large mouth, or the mouth is required to be kept widely open, the wedge is placed farther back in the mouth, and, of course, vice versa; its size, it would be an absolute impossibility for it to pass into the larynx. We notice that Mr. Braine has one in use.

FINE CIRCULAR SAWS.

The same firm send us a sample of these, which are made of the same thickness of ribbon steel as the thin metal shields, of which we recently gave a notice. They would be useful

in innumerable instances. We may here point out that the sharp edges of the mandrils in ordinary use have a tendency to cut this thin steel ; this may be obviated by rounding off the sharp edges on one of the " Emery Sharpening Discs " (which we have also noticed), or by interposing a very small circle of emery cloth between the mandril and steel saw or shield, the grit being turned towards the steel.

Abstracts of British & Foreign Journals.

EUCALYPTUS GLOBULUS.

By HARRY BENJAFIELD, M.B.

WHILST writing this I am surrounded on all sides with plants of eucalyptus globulus, from the tiny seedling a foot high to the huge blue gum (as the tree is known here) towering up some 300 feet. The medicinal virtues of its leaves have been long known, the aboriginal inhabitants of our beautiful island knowing of and using them for various troubles. The Bushmen often tell me of cures "by blue-gum leaves." One has applied the raw leaves to patches of rash ; another has kept a joint affected with rheumatism enveloped in them ; mothers tell of wonderful cures of diphtheria by enveloping their patients in clouds of steam from hot leaves covered with boiling water ; other people, again, swear by infusions of the leaves taken in wineglassful doses for all sorts of internal troubles. In fever cases nearly everybody hangs them about the bedroom of the patients, and in various lung troubles the leaves are burnt or smoked so that the patient inhales the smoke. We have a great variety of eucalypti, most of which are found in the other colonies, but Tasmania is the home of the eucalyptus globulus ; indeed, it is very doubtful whether it is indigenous to any other country, only stray plants occurring in Australia, and our Bushmen never dream of using any other variety as a medicine. When held up to the light the essential oil is seen in tiny globules scattered thickly through the leaf cells, and the most active medicinal properties appear to exist in this oil. Hitherto but little opportunity has been

given to test the medicinal powers of eucalyptus globulus, as practically none has found its way into the market. The eucalyptus oil sold, as given by Martindale and others, is distilled from, as Martindale puts it, "the leaves of eucalyptus globulus, and probably other species." This is quite true. A man who had worked for years in various Australian distilleries told me that he had seen but two eucalyptus globulus trees, and they were carefully preserved to show visitors. But our people would no more think of using peppermint (*eucalyptus amygdalina*) for their ailments instead of blue gum than your people would use oak instead of senna leaves. The peppermint is quite unknown here as a medicine; it grows as a low shrub or stunted tree on dry, rocky hills, with thin small leaves, which are rich in its peculiar camphorous oil. But the eucalyptus globulus luxuriates in wet ground, produces large scimitar-shaped leaves, as is in many ways the true "fever" tree. It contains but a small percentage of oil, and the oil is difficult to extract, but when obtained it is very superior to that from other eucalypti. Hang a bunch of other eucalypti, such as *E. amygdalina*, in a bedroom, and a bunch of this in another, and one soon recognises by the smell and air of the room the difference in the two.

Lancet.

A PROLONGED FORM OF ACUTE COCAINISM.

At a meeting of the Paris Académie de Médecine on December 2nd, M. Hallopeau presented a communication, in which, after distinguishing two forms of cocaine poisoning—namely, the acute, in which the symptoms are produced immediately after a dose and speedily pass off, and the chronic, in which they are due to the prolonged use of the drug—he related a case which in his opinion showed that the poisonous effects, while coming on acutely, might last for a considerable time. On March 7th, 1890, a man had about 8 milligrammes of hydrochlorate of cocaine injected into his gum as a preliminary to the extraction of a tooth. Toxic symptoms at once supervened. There was intense precordial oppression, with thready pulse, extreme excitement, and loquacity; the patient walked about the room, hitting out at random with his fists and crying out that he was dying. In ten minutes he became

quiet and the tooth was extracted, after which he was able to walk home, arriving there, however, in a state of extreme prostration. Then ensued a train of nervous symptoms, such as continual headache, intractable sleeplessness, bad taste in the mouth, with occasional attacks of excitement accompanied by giddiness, faintness, and a sense of impending death. All brain work was impossible; the patient could not do the simplest sum in arithmetic, and was in a state of profound depression. A sense of formication and numbness in the hands and forearms was almost incessant. This condition lasted four months, and it was two months after the injection before the least improvement was observed, and then progress towards recovery was very slow. M. Hallopeau thinks the symptoms indicate a poisonous action of cocaine on the nervous centres and especially the brain. As it is impossible to suppose that so small a quantity of the drug should have remained in the circulation, he is driven to conclude either that it was stored up in the cells of certain nervous centres or that it produced in them persistent lesions. The prognosis in such cases is serious, in the sense that the illness is severe and may be protracted, and the disablement for business is complete while it lasts.

British Medical.

THE INCREASE IN THE PROFESSION.

At the late meeting of the American Dental Association, a prominent member of the profession from the south, in an eloquent outburst of patriotism and loyalty, incidentally defending the course of the average American dental college, made the remark that instead of there being any danger that the profession would become overcrowded, we really did not have a sufficient number of practising dentists. Without further inquiry, it might so impress the casual observer, but a closer scrutiny of the actual figures will reveal the fact that dentists are being turned out of the colleges at a pace which may not be to the best interests of all concerned. We all understand that it is comparatively simple to manufacture professional men in the United States, that the mills are kept grinding at a rate which has made our educational system the laughingstock of the dignified scholarly educators of civilized lands.

The Dental Review.

GLEANINGS FROM THE AMERICAN DENTAL ASSOCIATION REPORTS IN THE DENTAL REVIEW.

LITERATURE.

Too many men look upon literature as a means of advertising. What inducement is there aside from the benefit that a professional man always feels in helping forward the standing of his profession by presenting questions to discussion ; what other inducement can an individual have to cause him to take the time necessary to write his paper ; take the time again to attend a meeting, pay his expenses and present it before an association ? Some men seek preferment and think to get it, and do get it through these means ; but it does seem when an association calmly invites a man to devote anywhere from 200 dols. to 500 dols. worth of his time, pay railroad fares of anywhere from 10 dols. to 50 dols., and hotel bills of a corresponding amount, they should be recompensed to the individual somehow. Undoubtedly each individual professional man owes to the body a tithe of work for the benefit of the whole ? But what proportion of dentists are working for the benefit of the whole. The few bear the brunt of literature, the few the brunt of clinics, some of the rest hold office, and the remainder take all that's offered them.

Chas. B. Atkinson.

RUBBER INLAYS.

Rubber Inlays look very well but the only one that I have ever seen that I religiously stood by, was one made from black rubber. White rubber, where it is used on the masticating surface wears out, not as fast possibly as gutta-percha, but it wears out rapidly. The inlay that I use in all large cavities for proximal and grinding surfaces I make from gold. My method is to cut a piece of proper size from a ribbon of gold rolled to about 100 to 120, and then to anneal it. A piece of cork, or erasing rubber is then cut to fit into the cavity. The piece of annealed gold is then placed over the

cavity, being held with the pliers in the left hand, while the gold is burnished, with a large burnisher into the cavity. The cork of erasing rubber is then put in place and held there and the edges are then burnished down. The overlapping gold should then be trimmed off, the whole annealed again and placed in the cavity with rubber or cork in the inside. The mouth should then be closed when the pressure of the rubber will make an adjustment of the gold on the margin of the cavity. The inlay should then be carefully removed and invested. Twenty carat gold should then be cut into strips and placed in the shell and melted there. The inlay should then be tried in the cavity, and more gold added if necessary—or some of it ground out, as the case may be. When it is thus completed, slight grooves should be cut around the part that goes into the cavity. It should then be set with oxyphosphate of zinc in a creamy condition, and be driven to place by tapping with a mallet. When it is thoroughly set it should be finished, as any other filling.

Dr. Swasey.

WHITE RUBBER INLAYS.

ONE point I wish to emphasize, and that is with reference to the use of vulcanized white rubber inlays in buccal cavities of molars or of bicuspid. Last year while in Europe I saw a number of specimens that had been prepared by a gentleman from Naples. He used the English white vulcanized rubber. This was vulcanized very hard and would receive a most beautiful polish, and if the teeth were dull in appearance and the enamel partially worn away, that surface could be finished so that it could scarcely be detected at any distance from the patient. This is not only a cheap, but a serviceable method of introducing an agent for the filling of teeth that will not be a conductor, as it is well known that one of the objections to rubber as a base for artificial dentures has always been that it was a non-conductor of heat, and hence injurious to the soft tissues.

Dr. Harlan.

PLASTER IMPRESSIONS.

I HAVE never heard of any one using my methods of preparing plaster so as to avoid the adhesion of the plaster to the teeth. The adhesion is due to the great affinity of the plaster for water, and unless that affinity is perfectly satisfied in the adding of water to the plaster in making the mixture, it will absorb every bit of the lustre from the teeth and then cause an adhesion. The first point then is that the plaster shall be thoroughly mixed. Have a large quantity of water—all that it would take up—and then wait long enough for the union to be complete ; that is one point. The next point is that I would add to the plaster from one-third to one-half of pulverized pumice, according to the strength of the plaster. Some plaster would not take more than one-half, while others would take two-thirds of pulverized pumice ; then it requires less water and the adhesion to the teeth is almost entirely prevented, and you get your impression out of the mouth with less liability to fracture.

L. C. Ingersoll.

CLIMATIC INFLUENCE IN PULPITIS.

DR. CROUSE : If I had so much better success with devitalizing pulps and filling roots than with capping, I would say so. But I do not have that kind of experience. I think a tooth is much more comfortable with a pulp in it than without, and for that reason it should be preserved if possible. I do not like to hear the practice of capping pulps abused or the idea thrown out that it is a failure when I know that it can be made a success. I like to hear the experience of practitioners, but I want them to be accurate and reliable ; and not based on the recollection of patients as to what occurred fourteen or fifteen years ago ; that kind of testimony is not of any value.

Dr. Storey : I would like to say to Dr. Crouse that he lives in Chicago and I live in Texas. He can save pulps in Chicago that he could not in Texas. I have been fought from one end of the United States to the other on the subject of filling the roots of teeth and upon the subject of destroying the pulps of teeth. I have been fought in my own dental association by men who tell me that they do not destroy any pulps. There is a funeral in my office about three or four times a week. I destroy the pulps always where they are exposed or the tooth is aching, and I don't have the patients come back to me with swollen faces. I do not practise dentistry to make trouble for myself and as long as I capped pulps I did make trouble for myself and for the other fellow too.

Dr. Crouse : You think that the climate has some influence?

Dr. Storey : It is climatic influence.

TREATMENT OF AN ADENOID GROWTH.

Dr. W. H. Atkinson said he would present the case of a woman who came to him with a peculiar and persistent adenoid growth. She was wearing an entire upper and lower set of continuous gum on a platinum plate, and there was an adenoid growth as far back as the plate went,—back to the pharynx. She had been treated in Paris and London, and at other places in her foreign travel, but without obtaining relief. He diagnosed the case, and in his treatment used a saturated solution of salicylic acid. He painted the tissues thoroughly until they were white. The next morning he found that the swollen condition of the tissues had decreased considerably, and finally subsided until there was left only a little redness of the parts. Soon the slough came away, and without the appearance of a drop of blood. Of course he resorted to constitutional treatment in connection with the above remedy, and in the course of a few days there was a complete cure. He was treating cases of this kind right along now in this way, and with gratifying results. *Cosmos.*

INVESTIGATIONS ON THE SENSE OF TASTE.

OEHRWALL (*Skandin. Arch. f. Physiol.*, II., p. 1, 1890), like other observers, recognises four kinds of taste, namely, sweet, saline, bitter, and acid. There does not seem to be any transition between these four varieties, so that the author regards the differences between them as those of modality, and not as qualitative differences of one sense. When cocaine was applied to the tip of the tongue the sensibility for adequate stimuli, that is, sapid bodies, disappeared, and even the electrical current failed to excite a sensation of taste. It is remarkable, however, that there remained only a sensation of heat or cold. The chief part of the communication deals with punctiform stimulation of the individual papillæ by means of fine brushes. There are marked functional differences amongst the papillæ. The fungiform papillæ are excessively sensitive to tactile, thermal, and cold impressions, so that by simply touching one such papillæ a very complex sensation results, first that of contact, nearly simultaneously cold, and then the taste sensation follows. Electrical stimulation may excite acid or other tastes. Goldscheider and Schmidt have also investigated this subject (*Centralblatt f. Physiol.*, vol. iv, No. 1, 1890). They find that certain parts lying between the papillæ do not excite the sensation of taste and that the several papillæ are not all equally capable of exciting the several tastes. In many individuals the taste of "sweet" alone is developed near the middle line on the hard and soft palate. Acid tastes are less developed in the circumvallate papillæ than on the anterior part of the tongue. At the anterior part of the tongue only the tip and sides seem to excite taste. The so-called alkaline taste, excited by a constant current, seems to be a composite result, due to a mixture of bitter and saline tastes with stimulation of sensory nerves as well. Between the papillæ there is never any sensation of taste. It is possible to fatigue the papillæ for one taste, for example, the circumvallate papillæ may, by repeated application of quinine, cease to detect bitter, while still capable of responding to sweet substances. Stimulation with acid, however, diminishes the excitability for all stimuli. It would seem from these researches that there are four different kinds of gustatory sensations—bitter,

saline, acid and sweet ; that each seems to be related to a special form of peripheral end organ, and that the papillæ are supplied in different proportions with these several fibres or nerve endings, so that it appears that the doctrine of the specific energy of nerves is also applicable to the sense of taste.

British Medical.

GOLD AND AMALGAM.

By G. W. DENNIS.

WHILE recognizing the value of gold, and especially soft gold at *vulnerable* points, we hope by using other materials to gain advantages not possessed by it alone. Gold and amalgam, or amalgam alone, have their respective merits ; the oxidation which is almost immediately commenced around such fillings tends to stop any minute crannies existing upon completion of the work. Gold fillings with a layer of amalgam at the cervical margin are, I believe, the best possible protection for teeth of the class now under consideration ; but here again we must attend closely to details or fail. A matrix is necessary, and should be narrow—but little wider than sufficient to cover the meeting place of the two materials. Having cavity ready, matrix firmly fixed in place, and instruments selected, prepare the amalgam quite dry. Place a small quantity against the cervical margin and burnish well, then another small piece *lightly* packed upon the first, as gold does not readily unite with a burnished surface. Now quickly condense a piece of Williams' crystalloid gold upon the amalgam until the gold colour is lost, and follow with more, until the mercury ceases to show, when the filling can be finished with any form of gold desired ; but *don't* smear the amalgam over the matrix or into the cavity, or your filling is spoiled.

Dental Review.

Reports of Societies.

STUDENTS' SOCIETY OF THE NATIONAL DENTAL HOSPITAL AND COLLEGE.

The last Ordinary Meeting of this Society was held on Friday, December 5th, at 8 p.m. P. W. Greetham, Esq., *President*, in the chair.

The minutes of the previous meeting were read by the Secretary and confirmed.

Messrs. Pariss & Gould were present as visitors and received the usual form of welcome from the President.

The following gentlemen were elected members of the Society :—Messrs. Barrett, Canton, Kublar and Slight.

The names of officers proposed by the Council to act for the ensuing year were announced.

CASUAL COMMUNICATIONS.

Mr. CARTER showed a model demonstrating the retention of a temporary molar, both bicuspid being in position.

Mr. T. G. READ described a case of irregularity that he is treating. Patient aged 12½ years; superior incisors and canines were nearly half an inch more forward than the inferior incisors; the lower lip rather thick, and when the mouth was closed filled the space between the two rows of teeth and the inferior teeth bit on the palate. Irregularity believed to be due to lip sucking. The dentitions of all other members of the family are fairly normal. Impressions taken and cast and the bite raised in S. S. White's articulator. An upper vulcanite plate made the bicuspid being capped, and the plate made so that the lower incisors, canines and bicuspid articulate with it. The space where the lower lip rested when the mouth was closed, was filled up by the vulcanite plate. In both sides of the plate in the bicuspid region an eye of gold wire fastened. Metal dies were obtained of the labial surface of the six superior front teeth and a small gold plate struck up to fit over them. This gold plate was attached to the vulcanite by elastic rubber rings which were tied to the gold plate and the eyes of gold wire

in the vulcanite plate. Weekly a small amount of the vulcanite behind the prominent teeth has been cut away and the elastic rings renewed. In two months the incisors are nearly drawn in and the molars have elongated, but it is discovered that the patient has renewed the lip sucking habit, the effect is not as previously to drive the upper teeth out as they are now pressed upon by the gold plate and elastic rings, but to press the inferior incisors in. A lower vulcanite plate is now made with a bar of gold wire projecting beyond the lower incisors to prevent the lip from reaching the teeth.

Mr. SPOKES showed a root which had been extracted by the "Screw" Instrument.

Mr. HUMBY made some observations upon the same instrument.

Mr. STANLEY READ showed a man called Roche who fell on a curbstone, on Wednesday, November 19th, and fractured his inferior maxilla at the Symphysis. An impression was taken and a Hammond splint made. This was adjusted on November 23rd. The splint is made of soft iron wire, soldered with gold and ligatured with tinned iron wire of two thicknesses, sometimes twisted to give further grip. The patient had his right upper maxilla removed for sarcoma 15 years ago, and an obturator was made for him, which still fits fairly well.

The PRESIDENT then called on Mr. W. J. Fisk for his paper on "Cleft Palate." [See page 10.]

A DISCUSSION then took place in which Messrs. Humby, Read, Rushton and the President took part after which Mr. Fisk replied and a vote of thanks was accorded him for a very able paper which was evidently the result of practical experience and considerable general knowledge of the subject.

Dental News.

VACANCIES.

The Dental Hospital of London, Leicester Square. It has been decided to appoint five additional Dental Surgeons. Applications to be sent together with testimonials to the Secretary.

British Journal of Dental Science.

No. 552. LONDON, JAN. 15, 1891. VOL. XXXIV.

THE TREATMENT OF DEAD TEETH.*

By LEONARD MATHESON, L.D.S.

Mr. President and Gentlemen,—It is with no small degree both of pride and pleasure that I find myself standing here, in response to the request of one of our energetic secretaries ; for I am proud to read a paper before a scientific society so flourishing and energetic as this Odontological Society of Manchester, whilst to meet old friends in such numbers as I do here, is surely a pleasure hard to beat.

I was kindly spared the difficult task of choosing a theme on which to address you, by a suggestion that the treatment of “dead” teeth would form an acceptable subject of discussion. I therefore make no apology for the title of my communication. For its substance, however, I feel bound frankly to say, that you will find in it, I fear, nothing new,—nothing that is not already known and practised by many ; and I should not venture to place what I have written before you, were I not convinced by experience of the occasional value which is to be found even in a simple recapitulation of well known facts and methods.

Such a recapitulation may remind us of half forgotten practices ; of methods which we have thought of trying, but in the press of daily work have not attempted ; it may suggest to us that whilst we have slipped into some narrow groove of theory and work, there are other ways of accomplishing the same end we are aiming at, which may be even smoother and more direct than our own ;—and if it does not do this, it does something perhaps better,—it stirs us up to communicate to others some method more or less peculiar to our own practice, which we have found, as tested by time and experience, to be valuable and trustworthy.

* A paper read before the Manchester Odontological Society.

To any dentist worthy of the name—to anyone, that is, who conscientiously aims at being something more than a magnified pair of forceps, or a good bench workman,—the subject of dead teeth, well worn topic though it may be, must always be one of interest, so long as such teeth continue to form such a considerable item in our daily work as they do now, so long as they demand in their treatment, as they do now, a nicety, delicacy and thoroughness, which makes great demands upon our skill and practice ; and so long as they afford—as experience hitherto has shown them to do—such abundant opportunities of demonstrating the value of painstaking and accurate work.

Although “Treatment” is my subject, you will excuse me if I refer quite briefly to the causes leading to “death” of the teeth. Caries, violence, the use of arsenious acid, and very occasionally, an attack of one of the exanthemata are amongst the well known causes ; but I should like to mention two others, one being I believe, not infrequent and certainly often unsuspected, the other being interesting from its rarity : I refer to the use of oxyphosphate filling ; and to pyorrhœa alveolaris.

I remember a former member of this society strongly insisting on the destructive effect exercised on the dental pulp by the caustic action of the phosphoric acid used in osteo fillings, when the latter are inserted in deep cavities presenting only a very thin layer of dentine on their floor ; and I am myself quite of the opinion that death of the pulp may not infrequently arise in this way.

Therefore, whilst setting great store by the use of phosphate fillings, especially in the preparatory treatment of children’s teeth, and as a non-conducting flooring under metallic fillings, I never insert them in deep cavities of living teeth without applying over the region overlying the pulp a protective film of mastic or carbolized resin. Such a proceeding reduces to a minimum the pain often produced by the introduction of the filling, and I believe prevents the ill effects which otherwise may arise from the near contact with the pulp of such a powerful escharotic as any substance must be which contains more or less free phosphoric acid.

Pyorrhœa alveolaris must be recognised as occasionally being the cause of death or partial death of the pulp. Its action is very insidious, and may easily be overlooked. To take a case in point, we will suppose that a patient presents himself with a history of severe odontalgia. The pain is

generally the worst at night, as soon as the patient has got warm in bed. A sloughing pulp is at once suspected. But there is no apparent evidence of such a condition, either in the way of deep decay or large filling: so far indeed as caries goes, the teeth are found to be remarkably sound, especially, it may be, the tooth to which one's attention is particularly directed by the patient. But in passing one's probe round the neck of this tooth,—we will suppose it to be a lower molar,—in search of hidden cervical decay, one finds that the point of one's instrument slips readily between the gum and the distal surface of the posterior root, and—changing our ordinary searches for a long fine point, it is found that this passes easily to the end of the root,—that in fact the root has become bared of periosteum. Then we realize what has happened: the periosteal disease has severed by ulceration the vessels entering the apical foramen, and the pulp is sloughing upwards, towards the pulp chamber and the anterior root.

It will be convenient I think, to group the successive stages of treatment under the following heads:—

I. Obtaining free access to the pulp chamber and canals.

II. The mechanical and antiseptic cleansing of the canals.

III. Filling the canals.

I. It is absolutely essential to success that clear access should be made both to the pulp chamber and its canals—clear enough access, that is, to allow of the entire removal of their contents. I say advisedly, access to the pulp chamber and canals, for it is quite possible to reach the latter without fairly reaching the former: *e. g.* through a small drill hole cut through the crown of a molar it may be quite possible to reach the canals, but quite impossible thoroughly to clear out the lateral and coronal portions of the pulp chamber.

In the case of incisors affected with extensive approximal decay, direct access may be easily obtained by slightly extending the cavity towards the centre of the lingual surface of the crown. Where, however, there is only slight decay present, or none at all, the pulp chamber is best reached by drilling through the lingual wall, as near to the cutting edge as can possibly be done without actually encroaching on it. In canines practically the same course is followed, except that in these teeth one may sometimes with advantage make one's opening in the centre of the worn cusp so frequently met with. A small stiff drill is the best to start with, as it pierces

the enamel sooner than a larger one. It may be followed by fissure or bud shaped burs, the latter being especially good in funnelling out the deeper parts of the tap-hole to the width of the pulp chamber. The new cross-cut fissure burs lately introduced are excellent for dealing with unusually hard enamel, but they wear out very quickly.

In bicuspid and molars, coronal cavities make access to the pulp chamber easy, though even here a good deal of cutting may be necessary thoroughly to expose it. In mesial cavities about a third of the antero-posterior length of the crown must be cut into. In the case of distal cavities, a narrow extension of them must usually be made for quite two-thirds of the length of the crown, and labial cavities must be run well up into the centre of the coronal surface. A prolonged and tedious use of the engine fissure bur is usually necessitated here; but often a good deal of time and discomfort can be saved by getting through the enamel with a fine small corundum disc. Whenever the close proximity of other teeth does not prevent this use of the disc, it will be found to be of great service. Some operators prefer, instead of extending distal and buccal cavities, to cut straight through the crown to the pulp chamber—making a tap-hole in fact. I do not much favour this plan, although I occasionally make use of it. The pulp chamber cannot be fairly reached through a small tap-hole, and if one is made large enough to effect one's purpose thoroughly, then quite as much cutting is often required as in the other method.

The whole of the pulp chamber being well exposed, its contents, often more or less clotted, may be stirred and partly withdrawn by a stiff Arrington's pulp extractor, and then as thoroughly syringed out as possible by a strong current of warm water directed through a fine bore nozzle.

So much for obtaining access to the pulp chamber and canals. If a free stream of water is required for syringing, as in the case of very foul teeth, or for use with the corundum disc, it is convenient not to apply the rubber dam until the syringe and disc are done with. But when these have done their work, and one can proceed to the cleansing of the roots, the rubber dam is of great assistance in doing expeditious and aseptic work.

I should like here, in passing, to call your attention to the rubber dam holder introduced some years ago by Dr. Farnell. I have been using it a good deal lately, and find it in most

cases preferable to the old head band, and much more comfortable for the patient.

II. Too much care cannot be exercised in the way in which the roots of a dead tooth are cleansed ; it is a process requiring at the same time downright thoroughness and great delicacy of manipulation, exact accuracy and a rigid adherence to antiseptic methods, if one's work is to result in a useful tooth, free from intermittent attacks of periostitis or alveolar abscess, with all their attendant evils. Broadly speaking, there are four classes of dead teeth that we have to deal with, and as the treatment of each class varies in some particulars from that of the others, I will take them *seriatim*.

a. Teeth in which the body of the pulp, though more or less devitalized, is still present, maintaining its continuity with the periosteum through the apical foramen.

This class includes those teeth in which the pulp has almost or altogether perished, either from disease or from the use of arsenious acid. Where disease has been the cause of the devitalization, a particular caution is required in some cases, lest a wrong diagnosis be made, and a wrong mode of treatment adopted. For example, a tooth, presenting the symptoms of death of the pulp, is opened up, and the pulp chamber is found to contain decomposed dark coloured, highly offensive semi-fluid matter. If now, on the presumption that the canal is in the same condition, its cleansing be vigorously proceeded with, and a drill be rapidly thrust up it, one may discover, at the cost of sharp pain to one's patient, and annoyance to one's self, that though partially sloughed away, there is still a considerable fragment of the pulp alive, which we have now driven up the canal before our broach or Gates Glidden, and which we may have no little difficulty in getting hold of to extract. Unless, therefore, there is reason to be sure that no pulp at all remains, a fine exploratory bristle should be passed up the canal before any attempt is made to remove its contents.

The body of the pulp being present then, whatever the cause of its devitalization, the best way of satisfactorily and totally removing it, has to be considered. The method I adopt myself is briefly this. Taking an average case, with a canal not rendered inaccessible by twist or narrowness, I first of all, without attempting to remove the pulp, loosen it and draw it gently downwards, and to *one side* of the canal, by means of Arrington's single-barbed pulp extractors and

Donaldson's bristles, using the while plenty of strong carbolic acid which at the same time helps to stiffen the tissue, and also to numb the sensitiveness so often found in the apical portion of it. Then, after warning my patient of a possible sharp touch of pain, I carry a fine chisel-ended broach, scarcely thicker than a bristle, right up to the end of the canal and give it a few rapid turns; this is followed by an ordinary multiple-barbed pulp extractor, which, being sent up just as far as the broach, and then twisted round several times, generally brings away the pulp entire. By keeping both broach and extraction to one side of the pulp—between it and the canal wall,—the danger of driving the pulp up upon itself is lessened, and the patient is saved much pain.

If the extractor is used without the broach, one has a great risk of tearing the tissue, instead of bringing it clean away, and if the extractor is not carried just the same distance up the root as the broach, one may very easily have a portion of the pulp near the apical foramen without being aware of it. A very simple device ensures the two instruments reaching exactly the same length up the root;—nothing more than a very small disc or collar of rubber dam set on each, at an equal distance from the points.

If after the removal of the pulp there is no bleeding from the foramen, or no more than can be easily and completely checked by the application of carbolic acid, it is as well to fill the canal at once. But if blood oozes freely, or if there is any periostitis about the root, a light wool dressing has to be applied for a few days. In mopping up blood or serum high up a canal, the rubber disc on bristle or broach is again most useful,—used as a gauge of the canal's length, for without it one is often in danger of imagining that the foramen has been reached, when the wince of a patient only means that one's wool bound instrument is acting as a piston, and though some distance from the foramen itself, is causing pain by compressing a column of fluid upon the wound left by the removal of the pulp.

6. The second class of teeth comprises those in which there is no history of death of the pulp, and nothing present in the tooth's appearance to indicate such death, except freedom from pain under excavation. There is no discharge, and no discolouration, and sometimes no actual opening into the pulp cavity. But excavation being painless, one's suspicions are aroused, and upon examination, no living pulp is

to be found, the canals and chamber being full only of its dry shrivelled remains. Although causing at the time absolutely no discomfort, such canals, containing apparently harmless and dessicated matter, will always be carefully cleansed and filled by the conscientious practitioner, as a necessary preventive of future periostitis, and possible abscess. In these cases it is frequently as well to keep the canal quite dry during the removal of its contents, although the use of chloroform or absolute alcohol is frequently helpful in getting hold of the debris and in thoroughly cleansing the root. The greatest care has to be exercised in order to prevent the passage of one's instruments, or of septic matter or air, through the apical foramen, and here the use of the rubber guage is once more evident.

c. Thirdly, there are the teeth in which death of the pulp has given rise to alveolar abscess of the blind variety, which finds an outlet only through the tooth, and not by a fistula on to the surface of the gum.

Here one's great care must be to very thoroughly cleanse the foul canal, without forcing septic matter through the foramen; particularly in chronic and indolent cases, where the discharge of pus has dwindled to a minimum or ceased for a time altogether, and when active disturbance of an acute inflammatory character may easily be set up in the old abscess sac. A fine smooth bristle is passed cautiously up the canal, the guage is set, and then the cleansing may be rapidly proceeded with, no time being lost in finding the length of the canal each time the bristle is passed up, and no danger run of passing it too far. The contents of the canal should be removed by wisps of wool at first, so small that when wound on a bristle or fine broach, the diameter of the instrument is scarcely increased, and all piston action so avoided. Often fresh wisps of wool have to be passed up a great many times before all purulent matter is soaked up, especially when the contents of a large abscess pour down the canal. When wool can be passed up the root and brought down dry, then an antiseptic can be pumped into the sac. For this purpose I use peroxide of hydrogen, and with no other drug have I obtained such good results. It ought to be quite fresh, and I therefore only keep a blue stoppered drachm bottle of it, getting it constantly renewed. I pump this freely up the canal, and do not cease the application until all gas bubbles and froth have disappeared, although in a great many cases I fail to perceive the bubbles

which are said by some to be invariably present when peroxide of hydrogen is used in the presence of pus. Sometimes the flow of pus or serum persists even after careful and prolonged mopping of the canal, and the subsequent use of peroxide, and then a dry wool dressing covered with mastic or gutta-percha must be applied for a few days; but in most cases a permanent root filling can at once be inserted.

d. Finally, there are dead teeth, the canal or canals of which lead to abscesses that open also by a fistula on the surface of the gum. In this class the process of cleansing and the use of peroxide of hydrogen is practically the same as in class *c*, but further measures have to be taken, in order, if possible, to destroy the abscess and its external sinus. For this purpose, a simple and generally effectual method is as follows. After peroxide has been freely and forcibly pumped into the sac, it should be followed by strong carbolic acid, the latter being employed not so much for its antiseptic as for its escharotic and stimulant action on the coats of the abscess and its sinus: if the acid can be forced right through the latter on to the gum, so much the better. After this pumping, the canal should be at once permanently filled, special note being taken as to the possible abnormal width of the foramen, as a result of absorption. The foramen being closed by the filling, a sharp spherical bur at least an eighth of an inch in diameter should be carried from the surface of the gum along the track of the sinus until the bare end of the root is felt, then all debris should be freely syringed out, and a tent of carbolized wool carried to the bottom of the wound. In nine cases out of ten, granulations will develop, and the sinus heal up from the bottom, the tent being gradually thrust out.

III. We may now briefly consider the operation of filling root canals. The one object to be achieved by filling a root is so effectually and permanently to close the apical foramen as to prevent the canal from becoming the receptacle of any fluid exudation (serum, blood, or pus), proceeding from the surrounding alveolo-dental membrane. A filling which only reaches part way towards the foramen, or which, though reaching to that spot, is of a porous or absorbent character, is an imperfect one, seeing that it affords no guarantee against the canal becoming the seat of putrefactive changes.

True, a root so partially and imperfectly filled, may last comfortably enough for a long time, but that will be due to

good luck rather than to good work, and if our pride and endeavour is to save as large a percentage of teeth as possible, we cannot afford to trust to luck. Again, it is, of course true that in a number of roots no filling can with certainty be carried right up to the apical foramen, owing to the crookedness and minuteness of the canals : here one is obliged to risk something. But in the great majority of cases, it is possible to reach the very end of the canal with a filling, and if this is done, and done properly, it is rare indeed that one has to sacrifice any dead tooth to the forceps.

How can the apical foramen be most effectually and permanently closed ? Three qualities in the material employed are requisite for success. First, a good root filling must be non-absorbent ; second, it must be easily adapted to the varying conditions of diameter, length, and general shape, which are met with in different canals ; third, it must be of a nature that will enable the operator to carry it with certainty right up to the foramen.

There are a great many kinds of root fillings, to discuss even a few of which would take up a whole evening. I can only now mention those which I have found most satisfactory without pretending to deprecate others, which in the hands of other operators may have proved to be as successful or more so. The root fillings that I make use of, are, I may say, practically limited to the following :—

Wood points in conjunction with Gutta Percha or with oxychloride of zinc.

In the majority of ordinary cases I use wood points with Gutta Percha solution or oxychloride, and I do so because by their means I find myself able to accomplish more satisfactory and accurate work than in any other way. With wood points I can fill soundly up to the apical foramen, and know that I have done so, with a regular certainty which, in my hands at least, no other method affords.

The canal is first thoroughly dried by absolute alcohol and hot air ; then a hickory point is chosen from a box of assorted sizes as supplied by S. S. White, the choice falling upon one which is thick enough at its thin end to require slight pressure in order to carry it to the end of the canal. To ensure the wood exactly reaching the apical foramen, a rubber disc is placed on its larger end in a position exactly corresponding to that of the gauge on one's broach, the length of the wood point, from $1\frac{1}{2}$ to 2 inches, easily permitting this.

The canal is moistened first with chloroform, and then with a solution of gutta-percha in chloroform and cajeput oil: the point is dipped in the same, and then carried slowly and steadily into place, any pumping action being carefully avoided. A sharp spoon excavator now cuts away that part of the wood which projects from the canal. Usually one or two points can be passed up at the side of the first, and a solid filling so made, the ends of the points may be covered by, and the pulp chamber filled with gutta-percha, or zinc oxy-chloride, or phosphate.

In cases where the canal cannot be kept absolutely dry in the neighbourhood of the foramen, owing to a little weeping of serum from the periosteum, I use thin oxychloride instead of gutta-percha solution, as the former has a coagulant effect on the serum, and as an escharotic does good to the weeping surface.

The use of wood points has this great advantage, that one can, by means of the rubber guage, tell to a hair's-breadth when the foramen is reached. By other methods, if in passing up the filling some pain is felt, one cannot always be certain whether this is due to pressure of air or serum on periosteum, or to contact of the filling with the latter.

Where we have a straight, simple, roomy canal, a filling composed wholly of gutta-percha may be used. Where the canal to be filled is very narrow and tortuous, I am glad to fall back upon the use of oxychloride and wool.

Allow me in conclusion, briefly to recapitulate and emphasize the points of treatment which I consider of prime importance. First of all there is the free exposure of the whole diameter of the pulp chamber and the openings of the canals. (For enlarging the proximal ends of the latter, Gates-Glidden drills are often useful, but for the distal ends I avoid, as a rule, any sort of drill, enlargement of canals being in my opinion in nine cases out of ten, unnecessary.) Then comes the cautious and thorough cleansing of roots by wisps of wool fine enough to ensure the avoidance of any piston action; and finally, the accurate guaging of the length of the canal, so that, on the one hand, putrefactive matter may not be thrust through the foramen, whilst on the other hand the filling ultimately inserted may be carried to its right position.

There are many points of interest and details of treatment that I should like to have touched upon, such as the comparative values of various antiseptics, the use of rhizodontology,

the bleaching of discoloured teeth, the method of dealing with inflammatory complicators, and so on, but time forbids.

It only remains for me to thank you, gentlemen, for the kind way in which you have received my desultory paper, half written, half impromptu as it has been. I feel that I have done but scant justice to my subject, and I can only plead stress of circumstances as my excuse for not having brought before you a more carefully finished piece of work.

ON THE REMOVAL OF HALF THE LOWER JAW FOR SARCOMA.*

By HERBERT LUND, Esq. F.R.C.S.

MR. PRESIDENT and GENTLEMEN,

The history of the case which I have both the honour and pleasure of bringing before your Society is briefly as follows :—

On May 5 of this year, I was asked by Mr. W. E. Husband Surgeon, of Burg New Road, to see a patient, Charles Glendenning, aet. 20, a sorter in the Manchester Post Office, who had a tumour involving the lower jaw. I obtained the following history.

Previous and up to March, 1889, Glendenning had enjoyed excellent health, had never had any injury to the jaw either from a blow or fall, but about this time he was much troubled with his teeth, particularly the back teeth of the right lower jaw. He went to a dentist (not in this country), but the attempt at extraction of one of the molars was a failure; in Glendenning's own words the dentist "seemed to push it downwards." There was much pain and swelling afterwards, but these subsided, and all went on well until about Dec. 1889, when a lump was noticed under the right half of the tongue. This lump gradually increased and small pieces of bone came away, "quite thin," as thin as eggshell. He had occasional pain, but this was not excessive; was troubled with the saliva which was constantly dropping out of the mouth.

Upon examination, I noted as follows: Under the tongue, extending from the right side, well across the middle line

* Delivered before the Manchester Odontological Society.

is a modulated mass, marked in places with maroon coloured patches, and raised quite half an inch above the general surface of the floor of the mouth. One mass reached on the right side of the lower jaw from half an inch anterior to the ramus and exterior across the middle line as far as the left canine. The greater portion of the growth is on the other side of the jaw, and is soft and elastic to the touch; but there is also a large expansion upon the outer surface which bulges out the cheek. The teeth are loose, and the tongue is pushed backwards and to the left side impeding deglutition and speech. No granular enlargement can be detected, the ramus of the jaw appeared to be unaffected. The mucous membrane over the tumour was quite free and moveable.

On May 14, 1890, I admitted the case under my care into the Salford Royal Hospital, and on May 17, I operated, removing the growth freely. My incision extended from a point on a level with the lobule of the right ear, along the lower border of the jaw to the symphysis. Here the lip was divided, but the horizontal incision was carried onwards as far as the canine tooth. The flaps being quickly reflected I sawed through the right ramus, and having extracted the left canine, divided the jaw again at that spot. The remainder of the operation was easy. A silk thread was passed through the top of the tongue in order to obviate the danger of this organ falling backwards, the flaps brought together by silk sutures, collodion painted on, and a drainage tube inserted at the angle of the jaw. The hæmorrhage was slight and easily controlled. In nine days the wound had completely healed, and on June 3, (op. 17th) patient left the hospital.

His present condition will speak for itself.

The points of interest in the case are:—

- (1) The onset, probably arising from injury in extraction of a tooth.
- (2) The ease with which a large mass could be removed.
- (3) The very slight deformity which has followed and the comfort which the patient experiences, and the ease with which mastication is carried on.

Mr. Skipp has kindly taken much interest in the case, and will, I believe, show by casts how the few teeth which remain in the lower jaw have adapted themselves to altered circumstances.

The growth, which I have here is in all probability myeloid in character, and is the least likely of the sarcomatous growths affecting the jaw to recur.

NOTES ON THE DEMONSTRATIONS AT THE
BERLIN CONGRESS.*

I have just put together a few notes on the demonstrations, in the hope that they may interest those who were not present.

The Dental School in the Dorotheen Strasse seemed a very conveniently arranged building, the rooms well lighted, and the dental furniture, such as the operating chairs, very good indeed. It was a pity that some systematic arrangement was not made in regard to the demonstrations, as they suffered considerably from the want of it; each demonstrator pitched his tent when and where he pleased, and there was a good deal of difficulty in getting patients suitable for the various operations.

The great crush was in the Extraction and Anæsthetic Room, owing, probably, to the fact of the exhibition of Bromide of Ethyl, an anæsthetic first used as such, by Nunnely of Leeds, as long ago as 1849, and which seems to have been taken up of late by many German dentists. As Dr. Silk, the London anæsthetist, remarks, in a letter to one of the journals, the conditions were such, that it was impossible to come to any satisfactory conclusion in regard to it. The narcosis is certainly not profound, and the curious English translation of a paper in German, "Stunning by Bromide of Ethyl," seemed to give a more accurate description of its effects than was perhaps intended by the translator. One patient, for example, a youth of about twenty, struggled and plunged about, called out, "Halten sie, halten sie;" but when quite conscious, half a minute later, ejaculated "Gar nichts," when asked if he had felt any pain. I could not help thinking that such an exhibition would be very demoralising to any chaperone or unprofessional companion of a patient in private practice. Prof. Busch, in reply to my question, said he certainly preferred gas to the Bromide of Ethyl. It is given much in the same way as ether, a facepiece being used, with a valve which is raised and the liquid dropped on a piece of flannel situated within the opening. A few weeks ago, a paragraph appeared in the *British Medical Journal*, giving a great number of untoward results from its use, including several deaths; and this fact of its not being so safe as was

* A paper read before the Odonto-Chirurgical Society of Scotland.

originally supposed, combined with the difficulty of obtaining and keeping it as a staple compound, will probably lead to its abandonment, or, at any rate, very partial use. The only other anæsthetic of a general nature that I saw used, was gas alone.

There was one point in the matter of the operation of extraction itself which must have been quite novel to many, and that was, the manner of removing upper teeth. The operator stood at the back of the chair, the patient having the head well bent backwards, and, grasping the forceps with the handles farthest from him, pushed, or rather drew, the blades towards himself. In this country, the operator always, I presume, stands on the right side, puts the left arm round the head, the right arm being as close as possible to the body, and the forceps are held with the thumb directed towards the blades, resting on and partly between the handles, near the joint, helping the fingers to control the amount of pressure on the tooth. In the German method,—or, perhaps, only the Berlin method,—the head is not under such thorough control, and the outstretched position of the arm, combined with the position of the thumb, resting on one of the handles, just where they are widest apart, is sufficient to destroy, at any rate to a great extent, that tactile sense which is so necessary for the successful performance of the operation. A better view may perhaps be obtained, but certainly not any better practical results, if one might judge from seeing a few cases.

Passing to local anæsthesia in the case of sensitive dentine, there were two new methods exhibited, both by Americans. Dr. Curtis showed an apparatus for employing nitrous-oxide gas, by means of attaching a strong leather-cased piece of tubing to the bottle, the other end being fitted with a nozzle with tap for directing the jet of gas. It seemed to answer well in the only case I saw it used, but owing to the bottle being one of those where the gas comes off very irregularly, in sudden bursts, and there being no quieter attached, the operator was unable to keep the blasts from going all over the mouth. It was also used for the painless extraction of a loose tooth; but here again the same unfavourable conditions, combined with the extreme looseness of the tooth, prevented a proper conclusion being formed. The principle of this operation was said to be “dehydration;” but how that can apply both to relief of sensitive dentine and the extraction of teeth one cannot very well understand.

Dr. Niles showed a little instrument, the idea of which was to apply the vapour of alcohol to the cavity, and which is the invention. I believe, of Mr. Small, of Boston. A small piece of metal tube is filled with cotton wool saturated with alcohol, and slipped into a somewhat larger tube with a closed end, and a rubber cork prevents the vapour escaping. Through the closed end passes a fine piece of metal pipe with a bulb on it, and which bulb is heated in the flame until the vapour passes off. The nozzle is then held for a few seconds in the cavity, and the excavation proceeded with. Having some sensitive parts at the neck of my canines, I acted as patient, and it certainly removed the feeling when scraped with an excavator, but I did not see it used in any good case of the kind. Since coming home I have tried it on a few occasions, but my faith in its efficacy is not very strong.

In the matter of fillings, there were demonstrations with the electric, Bonwill improved mechanical, and hand mallets. The tin and gold combination, which seems to have taken such a strong hold in Germany, I did not see used, except by a student, I think, who was filling an approximal in an incisor with it,—not certainly a very suitable place, but probably there was the question of cost. Mr. Brunton, of Leeds, in a distal cavity of a canine, demonstrated the method of using amalgam at the cervical wall, and finishing with gold. Then there was the method of glass filling, which Mr. Biggs has demonstrated to-night.

In the way of crown work, there was a demonstration of putting on a Richmond crown, by Dr. R. W. Starr, of Philadelphia, who confines himself entirely to crown and bridge work, and whose name is well known on both sides of the Atlantic in that connection. As there are various points of interest in the methods employed, I hope you will pardon me for giving a somewhat minute detail of the operation. The tooth was a right central incisor with a distal cavity, having an exposed pulp, and the distal corner broken off. The operator stated that he never used arsenic except in cases of back teeth, and also that teeth may be cut off with hardly any pain without its use. The tooth was nicked on both sides, labial and palatal, with thin discs, and cut off with an excising forceps in the usual way. Then taking a hickory peg, one end whittled down to somewhat less than the size of the pulp canal, the point was dipped in carbolic acid and driven home with a smart tap, producing evidently little pain, the projecting

end being then twisted off. (Since coming home, I have tried this method once or twice, and the results incline me to believe that where in a single-rooted tooth you have free access and a pulp canal free from secondary deposit, especially at the entrance, this is a much better method, because less painful, than the ordinary one of removal by a nerve broach. Dr. Harlan, of Chicago, a short time ago, gave his experience of half-a-dozen cases where he tried it, with the result that the majority of the patients left him, and some threatened him with an action for damages. These, however, were probably cases for filling, and the conditions much less favourable than when the pulp and pulp cavity are completely exposed, as in excision of the crown.) The root was trimmed entirely with the corundrum discs, bevelling especially the palatal portion, which was not ground down to the gum level. The diameter of the root was then taken with wire in the usual way, but instead of cutting it at the lap, which is the direction in the books, it was cut opposite to it and the divided ends straightened out, the twisted portion thus forming a convenient handle. One of the ends of the wire being shortened by about one-sixteenth of an inch, a piece of coin gold, number 29 of the American gauge, and about one-eighth inch wide, was cut off, the ends placed edge to edge, and soldered in the bunsen flame, forming the collar. This was then placed on the root, and, after a little adjustment, was forced up to fit tightly. It was then taken off, the gum edges bevelled, the sides being also filed concave, while the other edge was bent outwards slightly. Having been again placed in position, it was ground down to the level of the stump. A piece of plate of the same thickness as the collar was then placed on the top, held by a clamp and soldered. The superfluous plate having been trimmed off, the cap was finished and ready for adjustment. The root canal, with the remains of the wooden peg, was then drilled out deep enough for the pin the end, however, of the peg being allowed to remain as a permanent apical plug, the operator stating that the pulp was literally displaced or knocked out by the peg,—quite a new light to me, who always thought that the invariable practice was to remove the whole of the peg along with the pulp, as soon as it had been driven up. The cap having been put on, a sharp point was forced through it, opposite the root canal. A piece of gold wire, in default of a platinumiridium one, was then passed through the hole in the cap, so that it

was held tightly in place, and did not require the aid of wax to retain position. Taking the cap off, the pin was soldered, and the tooth was then fitted to the cap, the neck overlapping the gold in front, the whole of the adjustment being done in the mouth, so that there was no impression taken, from beginning to end. The tooth, cap, and pin were then put in a mixture of asbestos and plaster and soldered. To attach the crown, Dr. Starr used Baldwin's oxyphosphate cement, which he stated did not pack in pressing up into position, the excess oozing out readily and not requiring a vent hole. As to the time required for such an operation, he stated that a few minutes over an hour was sufficient for most ordinary cases.

Dr. Melotte, of Ithaca, another well-known authority, made a small bridge of one tooth, a lateral incisor, where the root had been extracted. As this demonstration was carried on simultaneously with the one just mentioned, I was not able to follow the detail so closely. A very nicely fitting gold band was made to fit the canine which was sound, about one-eighth of an inch being the width shown in front. To the side of this, the backed tooth was soldered with a small spur on the other side, resting against the back of the central, also a sound tooth. There was another demonstration of adjusting ready-made gold crowns, of which, however, I merely caught a glimpse.

The operation of implantation, as usual, attracted great attention, especially as its introducer, Dr. Younger, was the operator. The operation has, unfortunately, a sort of sensational side to it, and there seems to be a tendency on the part of its exponents to pander to that. I do not suppose that is was Dr. Younger's choice, but at any rate he was induced to use a bicuspid tooth of a mummy, the crown of which had crumbled off and was replaced by a crown of a natural tooth attached by cement. The root itself, I need scarcely say, was of that deep brown colour one finds in teeth whose age is measured by centuries. There was no possible reason for its use, except as I have just stated, and it seemed to be quite a degradation of an operation which is presumably a scientific one. In this case, no exception could be taken to the very neat manipulations of Dr. Younger himself, and which might be regarded as the redeeming feature.

Of mechanical dentistry proper there was little to be seen, Dr. Cunningham, of Cambridge, having it nearly all to himself, in his demonstration of a low heat porcelain gum, which

has been since shown at Exeter. His knowledge of all the official languages, enabled him to make the most of his auditors understand the process.

Though not a clinical demonstration, I may perhaps add, in closing, that the exhibition of micro-photographs by Mr. Mummery seemed to be the most appreciated feature in the dental section.

TREATMENT OF ADENOID ENLARGEMENT AND HYPERTROPHY OF THE ORAL TISSUES.

By CHAS. B. ATKINSON, D.D.S., New York.

IN adenoid enlargement and hypertrophy of the oral tissues, local stimulation and compression are indicated with systemic tonigation usually assisted by catharsis and alterative treatment. The local treatment in both of its phases may be chiefly secured through the use of a saturated solution of salicylic acid in alcohol, 95 per cent. This remedy should be *carefully* applied after drying the diseased surfaces with bibulous paper to prevent the spread of the medicine, owing to the affinity of the vehicle—alcohol—for the water ever present in the tissues. Increased advantage may be secured by using *blue* pyoktanin powder on the swab dipped in the salicylic acid solution. This absolutely suppresses any tendency to suppuration which often occurs in these congested surfaces.

It will be proper to state here that the pyoktania is a terrible thing to stain, and that tartaric acid for the face and mouth and muriatic acid diluted for the hands and tougher skin surfaces will remove the stain. Care in its use will obviate much evil for decolorants. In using both the blue and yellow pyoktanin it will be found that salicylic acid solution localizes the action of the pyoktanin and prevents the spread of the colour, which, when applied pure, is great, owing to the extreme solubility of the pyoktanin in the fluids of the mouth. Further local treatment will call for tannic acid paste which will be considered further on.

The salicylic acid solution may be repeated *daily* if care be exercised to prevent breaking the coagulated surface. In

case the continuity of the coagulum be broken, the raw spot or spots should be carefully dried and a *light* application of the salicylic acid solution be made. This may be of reduced strength if circumstances demand it. The reduction may be secured by adding known quantities of alcohol to produce the desired dilution. However, the saturated solution will be found to fulfil almost every possible condition presenting.

The salicylic acid treatment should be alternated (in the second week usually) with a paste of tannic acid in glycerine, made as thick as possible. Where the eschar develops a tendency to easily separate and to prematurely expose the new surface in active growth, the tannic paste is indicated to toughen both the eschar and the granulating surface beneath it. The application of the tannic paste should gradually take the place of the salicylic solution.

As the case progresses and the enlarged tissue is seen to reduce, the applications may be made at longer intervals, from two or three per day to once, then every other day, twice a week, weekly, and fortnightly, by which time most cases will be cured. Some will yield in two weeks, some require a year for the complete removal of the adenoid enlargement and the tendency to its recurrence.

The systemic treatment should embrace the exhibition of tonics :

R	Cinchonidinæ	-	-	-	-	ʒss.
	Acid sulph. arom.	-	-	-	-	ʒij.
	Alcohol 95 o/o	-	-	-	-	ʒiiij.
	Glycerine C. P.	-	-	-	-	ʒij.
	Aquæ dest. q.s. ad.	-	-	-	-	ʒxv.

M. Sig. One teaspoonful ter die—
and carthartios :

R 10 McKesson & Robbins
U. S. P. cathartic pill.

Sig. One on retiring as required.

And in extensive cases an alternative may be needed in addition :

R	Potass. iod.	-	-	-	-	ʒj.
	Aquæ dest.	-	-	-	-	ʒvj

M. Sig. Two tablespoonfuls ter die.

Further systemic indications are spare use of wines and alcoholic beverages. Malt liquors may be used in moderation. Starch should be avoided. Sugar may be used freely and salt plentifully.

The constant exhibition of an antiseptic mouth wash is of value in any treatment of the mouth and teeth :

R	Hydronapthol	-	-	-	-	℥ss.
	Tinct. calendulæ	-	-	-	-	℥iv.
	Aquæ dest. q.s. ad.	-	-	-	-	℥viij.

M. Sig. Use freely of the clear solution, without shaking, as a mouth wash.

In case mucous surfaces in contact should need treatment, a fold of bibulous paper smeared with vaseline or the tannic acid paste will be found an efficient agent in preventing adhesion of the contiguous surfaces and the consequent breaking loose of the eschar which is always an unfortunate accident, giving rise to much discomfort to the patient and prolonging treatment considerably.

The line of treatment as described is especially indicated in the numerous cases which present with passive congestion of the gingivæ, owing to the presence of non-conducting and ill-fitting dentures, which condition is a prelude many times to a chronic adenoid enlargement not at all easy to subdue. In such cases the construction of a new denture should be deferred until the enlarged surfaces are reduced to normal condition.

The place of the reduced tissue being supplied to the old denture with hard or "sticky" wax added from time to time as the increased space requires. The waxed surface should be smeared with the tannic acid paste before placing in the mouth.

To Dr. W. H. Atkinson belongs the credit of introducing the salicylic acid solution and the tannic acid paste for the treatment of these cases.

British Journal of Dental Science.

LONDON, JAN. 15th, 1891.

PAYMENTS AND NON-PAYMENTS.

In the definition "the first man to be called, but the last to be paid," most will recognize, at a glance, the family medical man ; indeed, so universal is this saying, that we know of many people who are fond of quoting it for the sake of protesting that it is a principle they never practice. This has recently been brought rather prominently before us by an action in the Queen's Bench, in which Dr. Anderson, of Richmond sued Lady Hay for his fees for medical attendance upon her and her boy from 1885 to 1889. There were a good many nice legal points in the case. Lady Hay has, upon her own petition, a judicial separation from her husband and was also awarded alimony, £170 for herself and £50 for her boy. Lady Hay was sued as a married woman in respect of her separate estate, but decided cases showed that alimony was not a separate estate, and there was no evidence that she had any other estate. Mr. Justice Smith concurred in this view, as regards the alimony, and said that under the circumstances the case must fail. We fancy this view of alimony is not generally known, and hence this case is interesting ; but it is also so, as showing the hardships under which medical men labour. If Dr. Anderson had refused to go when called he would, we believe, should serious results have followed, have rendered himself liable for prosecution on this ground and then, forsooth, when he does attend, advantage is taken of this miserable plea to cheat him out of his fees.

Fortunately for us, Dentals, we are not likely to be sued for refusing to attend patients, but the difficulty as regards obtaining the fees, when earned, is fully as great in the dental as in the medical profession. Leaving aside those patients, who come with the full and deliberate purpose of defrauding the Dentist of his fee, who though extant are, we believe, rare, there are yet many, who for various reasons never do pay, or perhaps **only** after the lapse of time. This is a most delicate and difficult subject to handle, on the one hand one has to escape the Scylla of harshness and seeming distrust of one's patients, and on the other to steer clear of the Charybdis of over-laxity in money matters and consequent loss. There is no doubt that one of the most important points is to adopt a systematic method both of keeping a clear and precise record of work done and keeping account books in a business-like manner. It must ever be borne in mind that patients are, as a rule, absolutely ignorant of the amount of work required, or that has been done, on their teeth and if fees are charged on any other than a time basis, cases will undoubtedly occur, and that not unfrequently, in which the account is looked upon as excessive. Now is the time that a careful record is of such importance, for here will be found chapter and verse for all the items of the account. Perhaps one of the most satisfactory methods to adopt, both from this point of view, and from others, is the system of marking on a chart, at the first visit, all that requires to be done, the patient then is far better able to realize the extent and consequently the probable cost of the work required and subsequent unpleasantness is often thereby avoided.

There is no doubt an idea abroad, that professional fees do not exactly take rank on the same footing as debts incurred in satisfying the ordinary wants of nature, and undoubtedly from being brought into such close personal relations with one's patients, one often does let fees slide, rather than take those measures for their recovery that an ordinary business man would adopt. It is, however, as well to point out that, as far as we know, with the exception of general practitioners and

dentists, professional men have protected themselves by adopting a system of prepayment. Medical and Surgical consultants are paid at the time, and not uncommonly get their fee, whilst the more hardly worked medical attendant gets none. Barristers are either prepaid, or their fees are guaranteed by the solicitor, who has abundant power in his hands not only to get these but his own as well. It is, therefore, especially important, that general practitioners and dentists should cultivate those business habits which will at any rate lessen their loss, and should at the same time encourage their patients to adopt the habit of paying their fees at the time of the visit.

ON another page will be found an interesting action at law for damages consequent on alleged negligence in extracting a tooth. We believe most who read the case in an impartial spirit, will agree with the Judge that the evidence offered was absolutely insufficient even to send the case to a jury. We must, of course, sympathize with any patient who should suffer in this way, but that is quite a different thing to saying either, that it is the Dentist's fault, or that he should be mulct in damages. At the same time, we are sorry to note that this dentist has so little faith in his own skill, that he feels obliged to blow his own trumpet by placing a placard in the window.

WE are very happy to insert "Hospital Reports" in our columns, but we wish the various House Surgeons would be a little more prompt in sending them in. They should reach us *within the first* week of the month immediately following that to which they refer. Hitherto they have wandered in, in a most erratic manner, sometimes the end of the month, sometimes the next month, sometimes one report, sometimes two together, and so on. Even if the House Surgeons take six weeks to do a simple addition sum, we cannot consent to be equally behind-hand with Reports appearing in our columns.

The Lancet gives an interesting resumé of Dental progress in 1890, but it is rather amusing to hear the extraction of a tooth under gas spoken of as a mere "formality" rather than an operation. All formalities are more or less odious, but certainly this would bear the palm in that direction. Would the writer of the paragraph think it a "formality" if he were the patient, or would he do so were he the operator trying to remove a wisdom for a nervous patient in the fraction of time allowed under gas. The use of words is, of course, perfectly arbitrary, and possibly "formality" does not convey the same meaning to the writer as it does to most folks.

DENTALS must appreciate the many services the *Lancet* has rendered to the Dental Profession, and will welcome the enormous number of two hundred pages with which it started its new volume. Quite recently one of our ardent reformers, wrote to the editors of two medical journals about a matter which he wished to ventilate. The *Lancet* responded with a leaderette, the other, which shall be nameless, did not, we are informed, even condescend an acknowledgement. We often have differed from the arguments of the *Lancet*, but we gladly point out to the profession, who is its friend at court.

THE importance of examining the teeth in diseases of (possibly reflex) neurotic origin, is illustrated by a case of Dr. Bakowski, quoted in the *Lancet* from the *Przegląd Lekarski*. The patient, a young Jewess, had been subject to epileptic fits for nine months, which latterly had become more frequent, there being several every day. Bromide of potassium, quinine, arsenic, and asafoetida had been given without any effect. Finally, although there was no complaint of toothache, it was decided to examine the mouth. Two teeth were found to be carious—the first upper molar on the right and the first lower molar on the left side. These were extracted, with the result that the fits entirely ceased and did

not return, though the patient was under observation for six months subsequently. Upon being closely questioned the girl remembered that before the fits commenced she had had some unpleasant sensations in the affected teeth, but nothing that could be described as pain.

AN interesting libel case was recently before the Yorkshire Assizes, in which a medical man sued the proprietors of "Mother Siegel's Syrup." The latter had issued 7,500,000 copies of a circular, headed "The Doctor's Terrible Mistake," in which was alleged that the Doctor, Mr. R. Dacre Fox, F.R.C.S., Edin., &c., had described a patient's case as "phthisis and dyspepsia" when it was only "indigestion and dyspepsia," and, of course, said to have been cured at once by the Syrup. Mr. Dacre Fox denied ever having written such a certificate.

In cross-examination it was shown that the patient, a guard, had received various payments from the defendants. Plaintiff was awarded £1,000 damages. We sincerely congratulate Mr. Dacre Fox, on having once again made such an exposure of the methods of quackery. It shows how altogether worthless are these letters of commendation. We should advise "Mother Siegel" to confine her attentions to indefinite cases, or to get a few letters from the Clergy, who seem always willing to write up Syrup's, Pills, and advertising American Dental Institutes, (so-called).

Dr. BARRETT, whom some will have met in England during last summer, has been writing a series of letters to the *Dental Review*, in one of these he deals with his visit to England. Apparently he does not regret this visit, as we read with interest his remarks concerning us. He attended some of our professional dinners, and our "toasts" seem to

have rather overwhelmed him, which, he says it takes from 3 to 7 men, "properly to launch and safely to house," whilst he considers the speakers "are more noted for their directness and force, than for any special graces of oratory." But an English hotel "smoking room" seems to have taken his fancy most. Here over a glass of something (what he does *not* add), he spent the most enjoyable hour that he ever spent at a society meeting.

"Uneasy lies the head that wears a crown"—unless the root was perfectly aseptic and thoroughly filled before the crown was attached ; says the *Dental Review*.

THE explanation offered by the member of the American Dental Association, who, at the annual meeting at Excelsior Springs, referred to his past pupils from New Jersey, as men whom he had "picked out of the gutter," that by this, he meant, they were not millionaires, will hardly strike most people as happy. Few folks are possessed of millions, indeed one could count the number of these favoured mortals on one's fingers, yet we do not suppose many would care to be spoken of as "being in the gutter." The New Jersey dentists do certainly object, and have "chucked" the worthy doctor out of their state society. All this storm in a teacup arose from the member objecting to New Jersey insisting on each man, whether he holds a diploma or no, passing a state conducted examination, before they are allowed to practise. The member immediately imagined the hypothetical case: supposing he wanted to practise in New Jersey, and then lost his temper at the bare idea of anyone presuming to examine him. But, surely, if a State thinks so lightly of Dental matters, as to insist that none except such as can pass a certain examination shall practise Dentistry, we at least may expect men occupying positions in the Profession to be sufficiently interested in the weal of the Profession to put up with a little irksome examination. Anyway, we have a very poor opinion of those who will not, and less of those who lose their temper into the bargain.

Manipulative Miscellany.

All new instruments or articles that it is wished to have described under this heading, are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

RICHTER'S DENTAL-CALENDAR FOR GERMANY.

WE have received a copy of this handy little calendar, which will no doubt be highly appreciated by German-speaking dentists. It is ruled to enter appointments. Messrs. Ash manage to compress a large number of advertisements into a few pages which form an appendix.

Abstracts of British & Foreign Journals.

THE OCCASIONAL ORIGIN OF TRUE ALVEOLAR ABSCESS FROM TEETH WITH LIVING PULPS.

By ARTHUR C. HUGENSCHMIDT, M.D., D.D.S., Paris, France.

The first observation I made was in 1883. The tooth, first right upper molar, had felt uncomfortable to the patient for some time. I found on examination the existence of a well developed typical alveolar abscess, immediately opposite

the anterior buccal root of the molar, from which a small quantity of pus was continuously discharging. Although the tooth had never been filled, I found it somewhat dark in appearance and more sensitive on percussion than any neighbouring teeth. I came to the conclusion that I had to deal with a dead tooth and decided to trephine it. But, as soon as I had passed through the enamel, the patient complained of that particularly severe pain often encountered at the junction of the enamel and dentine. I tried to go deeper but the pain becoming more marked I felt sure I had made a mistake, so I closed the tooth temporarily with gutta-percha. At the next sitting I made an exploratory trephining in both the neighbouring teeth; but here again I fell upon sensitive parts. I then concluded that I probably had to deal with a suppurating periosteal inflammation of external origin, traumatic or otherwise. I therefore enlarged the fistulous tract and then scraped the part of bone I came in contact with, which was in a necrosed condition. The abscess closed for a short time but soon reopened again, and when the patient returned, he directly pointed to the first molar as having been somewhat annoying a few days before. I hesitated no more; after having taken out the gutta-percha filling, I drilled as deep into the tooth as possible and applied an arsenical paste. The next day the pulp cavity was opened and the pulp was still sensitive and especially so in the anterior buccal root; profuse bleeding attended the removal of the pulp filaments from their respective roots; from the anterior root the pulp was easily removed the root and foramen being unusually large. On removing pulp from this last root I found it mixed with pus, and about its middle portion it looked to me as if some pathological process had been going on. The roots were treated antiseptically and the abscess disappeared and never returned, the tooth being in position to-day.

In the second case, the abscess was situated opposite an upper second molar tooth of the left side, on a level with the end of the roots, at an equal distance between the anterior and posterior buccal roots. The tooth had a very large anterior proximal cavity extending into the pulp chamber. The palatal and anterior buccal roots were completely devitalized, while the posterior buccal branch of the pulp was highly sensitive. Both the first named roots were antiseptically treated, so as to render them completely aseptic, while the posterior buccal root with its living nerve was left un-

touched. No change in the abscess occurred : it continued to discharge ; every morning a gum boil presented. Finally I devitalized this posterior root, and on removing the pulp I produced a very severe pain. Pus was found to surround the upper portions of the pulp. The apical foramen was also very large. The roots were carefully filled a few days afterward, and the abscess disappeared.

The third case is the most interesting one. The patient, a young lady of 17 years, had had her right central incisor filled with gold some five years before. Two years ago I saw her for the first time, for an alveolar abscess arising from a devitalized second bicuspid ; all the other teeth looked perfectly well.

In July, 1889, the patient came to me complaining of some uneasy feeling about her right central incisor. On examination I felt opposite the end of the root of that tooth a slight projection, which gave me the sensation of a blind alveolar abscess. Although this tooth already looked to me somewhat darker than its neighbour, I treated it with counter-irritants, aconite and iodine. This took away the uneasy feeling, but a well-marked projection still existed. In February, 1890, I found the projection more prominent ; it was the size and shape of a small pea, still nothing was done. In April 1890 the patient returned, stating that the abscess had burst a few days before. Physical appearance of the parts unmistakably indicated alveolar abscess, plus the dark appearance of the tooth, so I decided to trephine it.

I found sensitive dentine as soon as I had passed the enamel, moreover the tooth was sensitive to hot or cold water. I drilled as much as I could and then applied an arsenical paste, discharging the patient till the next day. When she returned, sensation was still very marked, so I gave her an injection of cocaine which enabled me to reach the pulp cavity ; as soon as I withdrew the drill a drop of pus, soon followed by blood, came out. Notwithstanding the injection of cocaine, when I tried to extirpate the pulp I found it highly sensitive, and it was only after having made an injection directly into the pulp canal and waited a few minutes, that I was able to remove the pulp altogether ; in this case again the apical foramen was unusually large. At the end of a week all traces of abscess had disappeared and two weeks after the extirpation of the pulp the tooth was filled and has given no trouble since.

The facts which have just been enumerated tend to show that a true alveolar abscess can occur from a living tooth.

For an alveolar abscess to be present in a living tooth, it is absolutely necessary, I think, that this enlarged condition of the foramen at the end of the tooth be present. Otherwise, should the foramen be normal, any local pulpitis would rapidly produce a congestion of the pulp and its rapid strangulation at the apical foramen. Only one other condition would prevent this death of the pulp by compression, and that is where the pulp was exposed in the crown of the tooth. In that case the inflammatory products could escape by this external opening. It will be noticed that hardly any pain was experienced in any of these cases, which is again explained by the enlarged condition of the foramen, which allows no compression of the pulp.

In a diagnostic point of view the only signs we possess are : First, the presence of an alveolar abscess immediately opposite the end of the root of a tooth. Secondly, a slight change in the colour of the tooth—a darker hue. Thirdly, the patient indicates that tooth only, as having been the seat of a slight annoyance but no pain.

These three signs being present, one need not hesitate to trephine the suspected tooth, even if the tooth is sensitive.

Finally the conclusions arrived at are :

1. That a true chronic alveolar abscess does not always arise from a completely devitalized tooth.
2. That a living tooth can be the source and only origin of a true alveolar abscess.
3. That an alveolar abscess in a *living* tooth can only occur if the apical foramen is abnormally large.

The Dental Review.

TO KEEP CAVITIES DRY.

Not infrequently does it occur in practice that cavities in the lower teeth are to be examined or treated expeditiously when the application of the rubber-dam would consume more than the available time. The expedient of pinning pieces of spunk, bibulous paper, or the folded end of a napkin against the sides of the teeth by means of a rubber-dam clamp, will be found to be both effective and time-saving.—W.S.H.

Dental Cosmos.

THE DENTAL PULP.—ITS DESTRUCTION.

By A. W. HARLAN, M.D., D.D.S.

PRIOR to 1836 the method of destroying the pulp of a tooth in vogue was heroic, *i. e.*, forcible removal with a broach or other instrument or the application of the actual cautery. From the time of the discovery of the fact that arsenic might be used (S. Spooner), up to the present day, it has more adherents than any or all other drugs or methods combined.

I have practised the operation of driving the pulp out of the root by medicated wood, cedar, hickory or orange wood, dipped in carbolic acid in a number of cases, and unless the cases are selected with great care, the results are not satisfactory. The impression produced on the mind of the patient is ineradicable should even a slight degree of pain be felt, it is also inapplicable in many cases where the operator most desires to practise it. To my mind, the mere fact of the wooden point being of necessity dipped in carbolic acid, undoes, at a moment's notice, the object of root-filling as a measure of the prevention of future pericemental irritation. All soft tissues, coagulated, are either transformed into calcific or corneous bodies or are exfoliated by virtue of the vitality of the underlying living tissues, resulting from the changing functions of the immediately subjacent layer of cells, or such coagulated bodies immediately become the prey of the anaerobic microbes present and in due course are completely destroyed by them and appropriated as food for their sustenance. During this process of destruction of a coagulated body, sulphuretted and phosphoretted hydrogen is slowly evolved, which must of necessity have an outlet.

At first these gases may pass through the apical foramen of the tooth if it offers the least resistance, but more frequently they permeate the dentine which has been deprived of the bulk of its animal matter by the destructive activity of the microbes present, which are not dependent on the presence of oxygen for the maintenance of their existence, and slowly but imperceptibly at first that portion of dentine which is thus excavated is filled with these mephitic gases until the dentine, not alone of the root but of the crown also, is

*Read before the Union Dental Meeting, Boston, October, 1860.

thoroughly permeated, causing the crown of the tooth to become discoloured. At first it is opaque; then slightly yellow, later bluish, and finally brownish or bluish-black. During the period of infiltration there may be slight tenderness of the tooth pressure; it may appear perceptibly longer and finally, unless encystment of the apex of the root supervenes a permanent lameness of the root takes place, which does not disappear. If the possessor be a person of robust health this may not occur for some years, possibly five or even ten, but it is the inevitable result of the permanent retention of a coagulant in the root of a tooth as the accompaniment of, or ingredient of a root filling. The final result to the patient is first a discoloured tooth, second a low form of irritation of the cementum and pericementum, impairing their vitality, and later the production of a blind abscess, which may be likened to a smouldering volcano, or the establishment of an abscess with a fistulous outlet which is a source of permanent discomfort to the patient, and which if relieved at all must be done radically; that is by the removal of the filling, including the wooden point (not always easy of accomplishment), the curing of the abscess, refilling the root and worst of all the restoration of colour, or whitening at least, of the crown of the tooth and the refilling of the original cavity—made much larger by the above series of disasters. The dentine of a tooth may acquire added discolouration if any red blood corpuscles are allowed to remain in the root or are adherent to the wooden plug.

Much, if not the whole, discolouration of a tooth may be prevented as follows: When the pulp is to be destroyed, the cavity of decay should be bathed or syringed with warm water, 100° F to 130° F. The crown, if there be sharp corners, should be trimmed with chisels, or in any way most familiar to the operator. A little square of rubber dam, two inches or thereabouts, should be slipped over the tooth and the one adjacent (if it be present) and the pulp is then exposed, and vinum opii or any anodyne applied (not carbolic acid) for a minute or two. After which use the following:

B Acidi Arseniosi ʒ i.

Hydrochlorate of cocaine, ʒij.

Lanolin ad. q.s. to make a stiff paste.

A small quantity should be applied directly to the exposure on a little square of gummed paper about $\frac{1}{16}$ of an inch in size. This should be covered with a pellet of cotton dipped

in lipid vaseline and the cavity is then to be stopped with soft gutta-percha, or if there be time enough a paste of oxy-phosphate of zinc may be used. If the patient is an adult (more than 21 years of age) the arsenical application should remain 48 hours. If under that age and more than 12 years 24 hours, under 12 years 8 to 12 hours is long enough. When the patient returns at the appointed time the little square of rubber-dam is reapplied and the dressing removed. Apply to the cavity immediately a pellet of cotton saturated with dialysed iron to antidote any arsenic adherent to the pulp or the cavity of decay. The first thing to be done then and there is to puncture the pulp with a fine sharp-pointed instrument. A little blood will escape which is carefully wiped out. Apply some peroxide of hydrogen on cotton with nickel-plated, platinum or gold pliers until the blood is destroyed. Gently wipe the cavity with oil of cassia, absorb the excess with paper or lint and then apply directly to the pulp a square of paper fiber-lint, wet with a saturated solution of tannin in glycerine, cover this with gutta-percha, or if the pulp appears to be still sensitive, apply at the same time a pellet of cotton saturated with myrtol, then seal the cavity with gutta-percha, and make two perforations through it with a pointed instrument not larger than an ordinary steel or brass pin. Dismiss the patient for eight days.

At that time it may be removed entire from the root or roots and immediate root filling may be practised.

The following precautions must be observed: No water or saliva should be allowed to gain access to the pulp chamber or canals, as this would be fatal so the maintenance of the colour of the tooth. Complete desiccation of the canals should be undertaken because on its faithful performance the future stability of the tooth depends. This may be accomplished in several ways. First, heat from an electric or other cautery. The Evans or Woolley root dryers may be used. Second, by the rapid evaporation of chloroform. Third, by the use of boro-glycerine or aqua-ammonia, and Fourth, by using absolute alcohol and dissipating it with hot blasts from a syringe and repeating this until absolute dryness is secured. When this is accomplished filling of the root at the same sitting is indicated; nothing will be gained by deferring this operation. Filling of the root is made possible in the following manner. Eucalyptol is introduced into the root on cotton, or otherwise, and after the excess is absorbed with

paper cones, a creamy solution of gutta-percha in chloroform is pumped into the root or roots until they appear to be well filled. Then slender cones of gutta-percha are introduced into the root by heating a fine broach which is thrust into the large end of the cone and carried directly to the apex, displacing the solution of gutta-percha and filling all interstices or foramina which may have been unnoticed. The object in first using the eucalyptol is to facilitate the diffusion of the gutta-percha as it is a solvent for it and it permits the complete filling of the root. *The Dental Review.*

VENT FILLINGS.

Exigencies in practice sometimes require the adoption of methods not consonant with what would be esteemed the correct modes if time or other circumstances would permit. A lower molar has, by the patients neglect, become pulpless. In such a case it has been the practice of the writer to properly prepare the cavity for filling. From a box of common cooking gelatine select or cut a strip, slightly warm it, and bend it into a bow-shape. Insert the end of one such bow in the distal and put another bow in the mesial root-canals. Out of the larger pieces of gelatine bows may be cut to suit the operator's purpose in any given case. It is, of course, assumed that proper preparation means drying as well as shaping the cavity, being careful to keep from the root canals anything that would obstruct them. The cavity is then filled with cement or amalgam, taking care not to displace the gelatine bows from the canals. So soon as the filling becomes hard enough to allow the admission of saliva, the gelatine will quickly soften so that the filling on that side may be finished flush, and the edges of the prospective openings be slightly smoothed with a suitable round bur. *Dental Cosmos.*

TO CONTROL OCCLUSION.—Place the trial plate and wax rim in the mouth ready for the imprint of the inferior teeth, then simply place the tip of forefinger at the front of the wax rim about where the lower teeth will touch and ask the patient to close his mouth slowly. When the inferior teeth touch the finger make the request, "Don't bite my finger, but bite back of it." At once, if he has bitten forward, the jaw jumps back like a machine.—HAROLD CLARK, Toronto.

Dental Cosmos.

THAT BARBARIC "KEY."

By E. COX, L.D.S., AUCKLAND, N. Z.

The question whether the "Key" is, or is not, in some cases the suitable instrument will and ought to be determined by experiment. As a rule it should be allowed, I think, to rest in peace having had its day, and accomplished its useful, and in some instances, unfortunate work. But I have recently had two cases in which I found in it a last yet lucky resort.

The first was that of a strong, rawboned, young fellow of four and twenty, with capacious mouth and large formidable teeth. He came with a left lower first molar broken down below the neck over the posterior fang and extensively hollowed over the anterior. It proved a veritable stonewall—fixed, and apparently immovable. Under the forceps what remained of the crown broke away, and the combined fangs defied all further assault by forceps or elevator. A slight coign of vantage was discovered on the lingual front of the anterior fang. I bethought me of the ancient key. Placing a small square of a amadou on the buccal side of the alveolar process and carefully applying the fulcrum and claw I turned over the stalwart foe until it lay waiting to be dislodged and removed by forceps.

The second case was one of the most vexation. A largely built man of almost giant height. A broken down lower left second molar protected and concealed by an elongated first molar. This "ragged rascal" defied and held his ground against all comers and was at last left not in peace but in the condition of the wicked.

Considerable inflammation and suppuration supervened and in the course of a week lancing became necessary and gave considerable relief.

About two months after the first visit the said "rascal" appeared with tempting coolness; his time had come. Not the least trying feature of this case was that the patient was a confirmed, fidgety, and highly nervous bachelor who had known little of pain or illness. Want of sleep and the operation had for the time disturbed and irritated his nervous system, and it is not surprising that the result upon an excitable temperament like his was "extraction on the brain." After an interval of nine weeks, seeing a chance I gently ye-

firmly persuaded him to allow a final attempt. I pursued the same process as in the first instance, and with more complete success, the lurking stowaway leaping right out as if really glad of a change of situation.

Dental Register.

GOLD INLAYS.

Regarding the question of inlays, it has been and is now my custom to prepare the cavity as for a gold filling, having the edges rounded, and, if an approximal cavity, obtain plenty of space between the teeth by previous separation with cotton or rubber. If there are any undercuts, I fill them with wax, so as to allow me to take an impression with modelling compound, using a small tin cup which I make, covering one or two teeth. If the cavity is properly formed, a perfect impression can readily be obtained.

Then I get a plaster model ; from that an impression in moldine, and with Melotte's metal poured in it I get a sharp die ; then swedge up pure gold of about 50-gauge, trim the overhanging edges of the gold, then place the gold in the cavity, and if the impression and die are accurate, the result is an inlay that fits perfectly. If, however, there is a slight discrepancy, or to make it doubly sure, I use a piece of as soft erasing rubber as I can procure, or a block of pure rubber, placing it over the inlay while in tooth, asking the patient to close his mouth. Of course, the gold should be annealed occasionally during the operation.

Then I remove carefully and immerse in hard-coal ashes and plaster, being careful that it does not run over the edge of the inlay. After it becomes hard, I then proceed to fuse into the inlay twenty-carat gold in small pieces, using a large flame, with which I have better success than with a small one, continuing until the cavity is even full ; then, if I wish any portion of the inlay contoured I add more of these pieces, using a very small flame and fusing only the portion I wish to contour. Then I cut a groove to receive the cement, and finish in the same manner as in gold filling. If possible, I never finish until the next day, as the work sometimes destroys the cement, therefore it is safer to delay finishing for twenty-four hours.—J. A. SWASEY.

The Cosmos.

Reports of Societies.

THE MANCHESTER ODONTOLOGICAL SOCIETY.

AN ordinary meeting of this society was held at the Grand Hotel, Aytoun Street, on Thursday evening, November 6th. In the absence of the President, Mr. Murphy took the chair.

New member.—Mr. A. H. Derwent, L. D. S., Eng., was elected a member of the Society.

CASUAL COMMUNICATIONS.

Mr. SKIPP showed a tooth, in which, during its treatment by a dentist, he had pushed a bristle through the apex of the root.

Mr. SIMMS asked whether, as a consequence of the bristle going through the tooth, irritation set in.

Mr. SKIPP replied that it caused an abscess to form, which led to the extraction of the tooth.

Mr. MATHESON said that some time ago a patient told him that he had a considerable amount of pain in a tooth which he, Mr. Matheson, had filled some time previously. He was rather proud of that tooth, because he had filled in a considerable amount of gold, and had fixed in the palatine root one of How's screws.

The patient said he had much pain while away, and had been to a dentist in the neighbourhood of where he was staying, who had removed the filling, and said he had found some of the pulp left in one of the roots. He (Mr. Matheson) examined the tooth, as he thought he had previously totally cleared the cavity, and found that the dentist had mistaken the periosteum and the floor of the pulp cavity for the live pulp; and that he had done his best to destroy the periosteum, which was then suppurating. He, Mr. Matheson, tried to save the tooth, but it would not answer, and it had to come out. He then found that the real cause of the pain, when the patient called upon the dentist, was in the next tooth, in which the pulp was exposed; but because the opening was small, he had overlooked it.

Mr. SIMMS said he desired to mention the use of asbestos, as a very useful covering for arsenieal dressings.

THE CHAIRMAN said it was a great pleasure to have amongst them the son of so worthy a father, who was willing to give

them his experience in an interesting case. He would call upon Mr. Herbert Lund to read a paper on :—"On the removal of Half the Lower Jaw for Sarcoma." [See page 59.]

DISCUSSION.

MR. G. G. CAMPION said that they ought not to allow such an interesting case as that shown by Mr. Lund to pass without some notice; the more so, as it was not a case that would often come under the notice of a dentist in ordinary practice. He thought it would be most interesting to see the case in another twelve months, in order to see to what extent the cicatrixal structure had contracted. The contraction had already brought the teeth on the under jaw quite inside the uppers, which was detrimental to mastication. The question was whether anything could be done to remove the difficulty. He thought it would be a hard matter to do. The question also arose whether at any time a band of cicatrixal tissue would be available for supporting anything in the shape of an artificial denture, and whether that could be made so as not to impede mastication.

MR. P. HEADRIDGE said he was under the impression that when the operation was performed some arrangement might have been made whereby the tissue which had now formed might not have taken such a strong character as it now did, and might left have room for a plate or artificial denture to have taken the place of the portion of the jaw which had been taken out. He was afraid there would be very great difficulty in getting over the contraction now. He thought nothing could be made, as they had no solid base to work upon. He thought that some arrangement ought to have been used to hold the jaw in its place whilst granulation was taking place.

MR. COLLETT asked whether it would be wise to use anything artificial, because there was the possibility that the plate might set up the irritation again, and cause the tumour to recur. And further it was said that ossification would take place so long as a piece of bone was left, and they ought to wait and see if it did occur.

MR. SKIPP said he should not like to undertake to make an artificial denture himself.

MR. SMITHARD suggested an apparatus that might have been used, but was of the opinion that if the tumour was at all malignant it was not advisable to use any apparatus at all.

MR. MATHESON said it was more than questionable whether

any good could have been done either before or since the operation. What they wanted was a point of resistance, and where that was to come from he failed to see. They knew what enormous power of contraction cicatrixal tissue had, and he did not think that anything would have been of service.

Mr. HOOTON mentioned a case where a plate had been fitted to the lower jaw, having on one side a rod which passed into a tube, which was fitted to the upper teeth, so that the rod slipped up and down in the tube. This preserved the parts in the desired position, but only allowed the movements of opening and shutting.

Mr. LUND, in replying, said he should hesitate very much to put anything in the man's mouth that might cause the slightest irritation; and for his part, he thought they had better leave it alone. He should never dream of putting in a plate or anything of that kind. As to fitting in a plate immediately after the operation it would have been impossible, as the tissues were too soft. He promised, if the members were willing, to bring the man before them again in another twelve months. (Applause.)

The PRESIDENT moved a hearty vote of thanks to Mr. Lund for his paper. They had all benefitted by it, and it only showed the necessity, in such cases, of sending the patient to an expert, as there was no doubt that a little delay in the present case would have cost the patient his life.

Dr. SHAW, in seconding the proposal, congratulated the society on the presence of Mr. Lund. It would be a good thing if members of the two professions met each other more frequently. The whole discussion showed that all would gain by it. He hoped it would not be the last time they would have the pleasure of Mr. Lund's company.

The motion was carried with acclamation.

The CHAIRMAN then called upon Mr. Leonard Matheson to read a paper on "The Treatment of Dead Teeth." [See page 49.]

DISCUSSION.

Dr. SHAW said they were all exceedingly pleased to have their old friend Mr. Matheson again amongst them. The paper he had read was perhaps one of the most important subjects that could have been brought before their notice. In his opinion there were a great many dentists who did not know what a "dead" tooth was. He (Dr. Shaw) had recently

had a case in which the patient had been treated by a dentist who was certainly unable to detect the fact that a certain tooth was dead. He was not in a position to criticise the paper, but he should have liked Mr. Matheson to deal more fully with those cases in which there was an abscess at the root of the tooth. The use of carbolic acid had been referred to an antiseptic, but he had always used pure wood creosote. He was certain that if they had more papers like Mr. Matheson's they would raise the dental profession, and save many teeth that were now lost.

MR. SIMMS said he had used Dr. Furnell's holder for the past three years to the exclusion of all others. In regard to the Swiss broach used by Mr. Matheson in excising the pulp at the foramen, he (Mr. Simms) thought the Donaldson bristle was more effective. So far as his treatment was concerned he never used the Gateshead, or any other drill. He was rather surprised that Mr. Matheson had not seen bubbles liberated when using per-oxide of hydrogen, as he (Mr. Simms) never found them absent when using the agent in the presence of pus. He himself found that the oxide of zinc was quite effectual in closing the canals. One would be disposed to think that in the use of wood points with gutta-percha, the latter would be apt to slip off, leaving the way open for the moisture to permeate the wood, and cause future trouble. He had recently had two cases of laterals, with abscesses at their roots, and despite all treatment he could not get the teeth into good condition, and one of them had ultimately to be extracted. He then found that the root was partially absorbed, and presented a number of sharp points. In his opinion perchloride of mercury was a most powerful germicide. He joined with Dr. Shaw in expressing the pleasure he had felt in Mr. Matheson's valuable paper.

MR. SKIPP mentioned the case of a man who had not lost a single tooth, but complained of pain over the molar regions. He examined the upper molars, and by the side of one of them he found an opening into the antrum. Regarding the tooth as beyond treatment, he extracted it, and with it came two large pieces of abscess sac. The patient had antral trouble for about six weeks, after which the wound healed. He would like to ask Mr. Matheson whether he had ever tried, when he found the nerve dead, to disinfect the matter before removing it.

He had been successful with peroxide of iron. Seeing that a large quantity of chloroform was used to make the gutta-percha into a solution, he would like to know what filled the vacuum when the chloroform evaporated.

MR. HOOTON said after they had got open the pulp canal, and removed the root, if there was any pain, then Mr. Matheson said that they must have driven some fluid through the foramen, or that there was a piece of the nerve left. He did not agree with that, for he thought in cases where the root had been removed without even the use of fluid, that any pain which was felt was only due to the natural sensitiveness of the apex of the root. What were they to do in the case of dead teeth which were caused by a blow, or by alveolar abscess, where the tooth was not decayed, or where the decay did not communicate with the pulp cavity? Should they remove them? His own experience said not. That was contrary to what was taught, but he thought if they removed the teeth, they might cause abscesses, and so lead to further trouble.

MR. P. HEADRIDGE said he would not use a syringe to "dead" teeth, and he never attempted to touch a tooth until the nerve was quite dead. If they had "dead" matter in the root of a tooth, they wanted to destroy it with as little pressure as possible, and not by using the syringe, perhaps, drive some of it through the foramen. He always thoroughly dried the tooth before attempting to disturb the "dead" matter.

MR. DOUGAN said he did not agree with partially cleaning a cavity, and then closing it up, and then starting a fresh hole in the mesial surface of the tooth. Mr. Matheson had spoken about removing "half-dead" pulps, which was a very difficult thing, and for which various ways were recommended. Mr. Headridge's caution not to use a syringe, simply showed that there were other satisfactory methods of accomplishing the same end. He himself thought that where the nerve canal was at all constricted the opening should be made larger. In regard to the use of antiseptics to thoroughly cleanse the root canals, he also thought he could effect the object with equal success by merely using warm water. One objection to using perchloride of mercury was that the metal being inserted in the roots of the tooth by a metal instrument, the mercury was precipitated on the instrument, and the drug rendered inert.

MR. WHITTAKER asked what they were to do in the case of a nerve which was not dead, but exposed. He had sometimes found that the nerve would not always die. Then again in the case of root canals where they could not find an access, such as in the anterior molar, did he (Mr. Matheson) open them out?

MR. MATHESON in reply to some of the questions, said that some of them related to points which he had not touched upon that evening, although he should have liked to have done so. In regard to cases of an obstinate nature, he found that patience, and great care in the use of any medicaments to the root of the tooth, was the best means of combatting them, Mr. Skipp had thrown out a very valuable hint in regard to giving such teeth a complete rest, and also being careful to see that their companions did not impinge upon it, and so cause irritation. He was obliged to Mr. Dougan for pointing out that when the wood points were soaked in paraffin, they became impervious to moisture. Mr. Whittaker's question went beyond his subject of that evening, but he had had cases where arsenic would not destroy the pulp, and in that case he had filled up the cavity, and had found that the tooth was always comfortable afterwards. In conclusion, he might say the kindness was not all on his part in coming there that evening, and he should have much pleasure in being present on some future occasion. (Applause).

The CHAIRMAN presented the thanks of the Society to Mr. Matheson for his paper, and the proceedings then terminated.

ODONTO-CHIRURGICAL SOCIETY OF SCOTLAND.

The First General Meeting of the Society, Session 1890-91, was held on November 13th, the President, Mr. JOHN A. BIGGS, in the chair.

After a few introductory remarks, the PRESIDENT vacated the chair and proceeded to give a demonstration on Dr. Richter's Glass Inlays. He showed several teeth with the work in various stages, from the prepared cavities to the com-

pleted inlays, many of the cavities being, for ordinary inlay work, very difficult. He also showed a canine tooth with a large cavity in the labial side, which he filled with an inlay in a few minutes. Mr. Biggs said he did not come before the meeting to advocate inlay work at all; he thought it had not been sufficiently long before the profession to definitely say whether it would be permanent or not. His opinion was that the cement necessary for its retention would give way, unless in circular cavities. But he thought it would interest those who had not tried it, and therefore he had brought it before them. This kind of inlay promised much. It was rapid, simple, and effective. It was difficult to attain the desired shade, and required care and scrupulous cleanliness in its manipulation; but the result could be achieved in a tenth of the time necessary in the use of porcelain inlays.

The demonstration was received with much interest, but, in accordance with the custom of the Society, the discussion was postponed till the following meeting.

On the President resuming the chair, Dr. WILLIAMSON read a communication entitled "Notes on the Demonstrations at the Berlin Congress." (See page 61.)

Mr. WILSON exhibited an upper molar, the pulp of which had become calcified after its exposure through fracture. Also the model of an under jaw, showing suppression of lateral incisors with a good history, as the patient and her parents had taken considerable interest in the teeth not coming as they ought.

Dental News.

We regret to record the death of Mr. John Marshall F.R.S., F.R.C.S. etc., President of the General Medical Council. Mr. Marshall was in his seventy-second year and had lived a very active and useful life. To enumerate half the posts he had filled would take more space than we have at our command but we may mention that he had passed through the posts of Assistant Surgeon, and Surgeon to that of Consulting

Surgeon, to the University College Hospital. He held examiner ships at the College of Surgeons and the University of London, and was in 1883, President of the former Institution. For the last eight years he had been the representative of the College on the Medical Council, and in 1887 was elected President of this body. It was this post which brought him in contact with the Dental Profession, who are indebted to him for the attention which he, at great sacrifice of time, devoted to its affairs. His scientific labours and writing obtained for him, in comparatively early life, a Fellowship of the Royal Society, and he twice served as a member of its Council. Mr. Marshall had held the lectureship on Anatomy at Art Schools, at South Kensington, and was at the time of his death Professor of Anatomy to the Royal Academy of Arts.

We must also mention the death of Mr. Edward Bellamy F.R.C.S., who, as surgeon to Charing Cross Hospital, has come in close contact with so many Dental Students.—Mr. Bellamy was comparatively a young man, being only 48. He had held various appointments at Charing Cross Hospital, and was Lecturer on Anatomy, and later, of Surgery in its Medical School. Mr. Bellamy was also Lecturer on Anatomy in the Art Schools, at South Kensington.

LEGAL.

ALLEGED UNSKILFUL DENTISTRY.

At the Birmingham County Court, before his Honour Judge Chalmers and a jury, an action was heard by which William Thomas, a joiner and carpenter, living in Tiverton Road, Selly Oak, sought to recover from Frederick Frobisher, chemist, of Selly Oak, £50 damages for injury and loss, which plaintiff, alleged he had sustained by reason of the negligence or want of a proper degree of skill or care on the part of the defendant in extracting one of plaintiff's teeth. Mr. Tyler appeared for the plaintiff, and Mr. Vachell for the defendant.

Plaintiff, who is a young Welshman from Dinasmawddy, in Merionethshire, said that in December 1889, soon after he came to live in the neighbourhood of Birmingham, he was suffering from toothache, and was induced by a friend to visit the defendant for the purpose of having the aching tooth extracted. Defendant exhibited in his shop window a card with the words "teeth carefully extracted."

Defendant placed him in a chair, and having put "a sort of a screw" into his mouth, pulled his head down-wise, then to the right, and then to the left, but did not succeed in dislodging the tooth. He then told him to hold his head back, and finally, after a lot of tugging, got the tooth out. Some days afterwards his face became very painful, and he visited Mr. Payne, a surgeon, at Selly Oak, who treated him. On the 24th December he went home to Dinasmawddy for Christmas, and while there his face became much worse, and he had to call in Mr. Williams, a surgeon there. He remained under his treatment until March, and then returned to Birmingham and until quite recently had been a patient at the Queen's Hospital. He had had there operations performed on his jaw, and had been told that it would eventually get better, and he would be disfigured for life. He had in consequence of this injury been out of employment eight or nine months, and lost from £70 to £80 in wages alone.

Mr. Tyler's allegation was that the defendant had extracted the tooth in such a careless and unskilful manner that he had fractured the plaintiff's jaw, and that for this gross negligence he was liable to compensate the plaintiff.

Mr. Arthur Ward, surgeon dentist, of Birmingham, said he examined the plaintiff's jaw about three months ago, and from the appearance of the jaw, and the description of the operation which plaintiff gave him, he came to the conclusion that unnecessary violence was used in extracting the tooth. The outside of the jaw was out of place, and there appeared to have been a slight dislocation, and also a fracture of the bone. In that examination Mr. Ward said the appearances were not inconsistent with the removal of diseased bone by a surgical operation.

Mr. Williams, the surgeon from Dinasmawddwy, said when plaintiff came to him he was suffering from inflammation of the bone of the right lower jaw, and from the appearances and what plaintiff told him he came to the conclusion that the in-

jury was the result of the tooth-drawing. He found broken bits of bone in the jaw, and these bore out the theory of great violence. It looked as if a piece of the socket of the jaw had been pulled away with the tooth, and there was a great discharge of matter. The jaw would never resume its normal shape, and there would be permanent scar on his face from the subsequent operations. In that examination witness said inflammation of the jaw was sometimes set up idiopathically, but this was rare in healthy persons, and he thought that if it had arisen in this way with the plaintiff he would have had pain and swelling for a much longer period than he said he had. Apart from the history of the case there was nothing inconsistent with inflammation set up idiopathically, but knowing the plaintiff and his family well, he did not think it likely that it could have arisen in that way.

William Arthur Payne, M.R.C.S., of Selly Oak, said when plaintiff consulted him in January last in reference to the state of his jaw and examined it and found marks of a recent fracture and signs of inflammation of the substances and covering of the jaw. He did not think that was due to unskilful extraction of a tooth. He rather thought the bone was soft from previous inflammation, and was therefore easily broken when the tooth was extracted. He thought plaintiff was suffering from periostitis when he went to have his tooth out, and there was no appearance of any bungling or unskilfulness.

In cross-examination by Mr. Vachell, witness said that when he saw plaintiff on the 8th December, 1889, he was certainly suffering from periostitis, and he thought it highly probable that he was suffering from it when the tooth was extracted. Frobisher, the defendant, had been at Selly Oak for about fifteen years. He did not advertise himself as a dentist, but witness had sent patients to him to have teeth extracted, and had also borrowed instruments from him. He could not say whether he was a skilful operator or not, but he had heard no complaints from his (witness's) patients who had had teeth extracted by him.

Plaintiff, recalled by the Judge, said there was a small hole in the top of the tooth which was extracted.

Mr. Vatchell submitted, at the close of the plaintiff's case that there was no case to go to the jury of negligence.

His Honour agreed, and after hearing Mr. Tyler, told the jury that before the case could go to them, plaintiff must not

only prove that he had suffered, but make out a *prima facie* case of negligence, and he (the judge) held that he had not done so. There must, therefore, be a non-suit with costs. On the application of Mr. Tyler his Honour consented to suspend execution for a month, or pending appeal.

IMPUDENT ROBBERY OF DENTAL INSTRUMENTS.

At Kingston (Surrey) Borough Police Court, on Thursday, the 1st inst., George Murdock (45), a clerk, who refused his address, and James Robinson, a boiler maker, of 49, Princes Road, Lambeth, were charged with being concerned together in stealing 21 pairs of dental forceps, 20 hand pluggers, 10 malleting pluggers, 19 handrose drills, and one book of Scott's poems, value £10, the property of Herbert Bellamy Garnett, dentist, of 25 High Street, Kingston. The prosecutor identified the whole of the articles produced as his property, and gave evidence as to value. The instruments, he said, were in a cabinet in his surgery early the previous afternoon, and the book of poems was in the waiting room. About half-past two in the afternoon, he was called away, and left his surgery in charge of his page boy. When he returned, he found the prisoner Murdock there. He asked witness if he could recommend him as a man nurse, but he told him he could not think of doing so, and his suspicions not being aroused, he let him out. When the man had gone he asked his boy whether he thought anything had been taken, and upon looking into a drawer, in the surgery, he missed all the instruments detailed in the charge. Witness proceeded to the police station, and was afterwards walking along Edon Street with a detective, when he again saw Murdock, who was then in company with Robinson. The men were then apprehended, and upon being searched at the station, all the property was found upon Murdock.

Frederick Fry, the prosecutor's page boy, deposed to Murdock going to Mr. Garnett's house, while that gentleman was absent, and saying he wanted a tooth drawn, witness showed him into the waiting room, but subsequently asked him to take a seat in the surgery, where he remained

until Mr. Garnett returned, which was about ten minutes.

Robinson declared that he knew nothing whatever of the robbery, and Murdock confirmed this statement adding : " If either of us ought to be punished its me. That man knows nothing whatever about the affair."

Robinson : He told me he was going after a place as a sick nurse.

Police evidence having been given as to the prisoners being seen together, both prior to, and after the robbery. The magistrate remanded both men for enquiries to be made into their characters.

APPOINTMENT.

Percy A. Linnell, L.D.S. Eng., to be Hon. Dental Surgeon to the Ancoats Hospital, Manchester, *vice*, H. C. Smale, resigned.

VACANCIES.

The Dental Hospital of London, Leicester Square. It has been decided to appoint five additional Assistant Dental Surgeons and not five additional Dental Surgeons as stated in our issue of January 1st. Applications to be sent by the 20th inst. to the Secretary.

Dental Hospital Reports.

STATEMENT of operations performed at the Royal Portsmouth Portsea and Gosport Hospital, from Jan. 1st, to Dec. 31st, 1890.

Teeth extracted	.	.	.	.	.	.	.	797
" " Under Chloroform	.	.	.	.	.	.	.	31
Advice, Scaling, &c.	.	.	.	.	.	.	.	212
Irregularities of the Teeth	.	.	.	.	.	<i>i</i>	.	122
Total	.	.	.	.	.	.	.	1162

W. H. KIRTON, L.D.S., Ireland, *Hon. Dental Surgeon.*

British Journal of Dental Science.

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ON THE CAUSES OF HÆMORRHAGE AFTER TOOTH EXTRACTION AND THE IMMEDIATE TREATMENT.*

— — —
BY BENJAMIN WARD RICHARDSON, M.D., F.R.S.
— — —

Mr. President and Gentlemen,—Thirty-two years ago I delivered before the then existing College of Dentists a lecture on hæmorrhage in its bearings on the practice of dentistry. This lecture, very favourably received at the time, and very often quoted since in works of general as well as dental practice, largely increased my after experience on the subject on which it treated. Every year brought me into contact with new cases and new facts, and I find, on reference to notes taken in the year 1871, that I was called six times during that year to arrest hæmorrhage after tooth extraction. This was exceptional; but, altogether, spread over the long term of practice I have passed through since 1856, and excluding seven previous years of preliminary medical studies, I must have had from one hundred and twenty to one hundred and thirty instances of hæmorrhage under my care. It is from the study of this experience I shall venture to speak to you to-night, and if I succeed, I shall be gratified. If I fail, I shall, Sir, throw all the blame on you for having chosen the subject.

The subject is essentially practical, and to deal with it in a practical manner I shall divide it into two parts, namely; Cause and Treatment.

* A paper read at the Odontological Society.

PRELIMINARY NOTE ON COMPARATIVE RARITY OF HÆMORRHAGE AT THE PRESENT TIME.

At the outset I should like, however, to make an observation which nothing except a long experience could supply. I am quite sure that the accident of hæmorrhage after extraction of the teeth is much less frequent than it was a quarter of a century ago. At that time it was, comparatively, a common accident. For my own part I have never had a case which ended fatally, although two or three have approached very near to a fatal termination ; but I knew, before the period I have named, of more than one death from the hæmorrhage. Since that time I have not known of one fatality, and the occurrence of bad cases is much limited. There is not the least reason for surprise at this fact, for many causes are at work leading to it. In the first place, the progress of dental surgery is greatly advanced ; the rude method of operating with the key or with coarsely constructed forceps has ceased. Secondly, the knowledge that different teeth call for different modes of manipulation or different instruments—knowledge once altogether confined to a limited few—is general knowledge and practice. Thirdly, the means to be adopted to stop hæmorrhage, if it be developed, is much more accurate than it used to be. The operator has gained confidence, and, with that, coolness and patience in endeavouring to arrest the flow of blood—elements of treatment of the supremest importance. Beyond these advancements there is yet another, which probably ought to stand first. I mean that what we physicians call the hæmorrhagic diathesis is greatly reduced amongst the members of the community. This is one of the most striking facts of our civilization—so striking that I am rather surprised it should have been left to me to call attention to it. In plain words the blood of the nation has improved in quality. What was termed scurvy was not long ago a prevailing condition. There was land scurvy and there was sea scurvy. Now both are much less common. But the scorbutic state induced in all cases by an improper diet, or descending by heredity from parents who have been badly fed and badly nourished, meant above all things else poor blood, blood that would not coagulate or seal up the broken vessel. Such blood was made by bad food ; it was also made by bad drink, for it is the blood of an intemperate community, and bad food and bad drink having to

some extent been dismissed and replaced by wholesomer substances, the blood is of better substance, is a sealing blood, and ceases to flow out of minute vessels less seriously, because it makes for itself the best of all plugs in its semi-solid or coagulated form.

CAUSES OF HÆMORRHAGE.

Coming now to the practical part of my subject I cannot do better than reconfirm a position I originally maintained, namely, that there are three distinct conditions leading to dangerous hæmorrhage after extraction of teeth : (1) abnormal fluidity of blood in the subject submitted to operation—purpuric hæmorrhage ; (2) deficient contractile power of the divided vessels—vascular hæmorrhage ; (3) Mechanical lesion favouring the flow of blood—mechanical hæmorrhage,

HÆMORRHAGE FROM FLUIDITY OF BLOOD.

We must bear in mind what has been said above relative to the present comparative rarity of this form of hæmorrhage. Although much less common now than formerly, hæmorrhage from fluidity still occurs. The examples of it divide into two classes—(a) the *aqueous* and (b) the *scorbutic* or *saline*.

The pathological character of the *aqueous* type is special. The blood of the patients who are subject to it is in a state of extreme fluidity, the fluidity being due to an excess of water, so that the plastic parts of the blood, and also the saline parts, are dilated in an unnatural degree. I do not know of any proof that in these cases there is an actual deficiency of fibrine. If there were, the muscular structure of the patient would probably undergo some modification—a condition by no means necessary, since the disease may be seen in persons whose muscular development and muscular power is good, if not perfect. But in the blood the relative natural proportion of water is in excess, the cohesive attraction between the particles of the colloid is reduced, and the blood, imperfectly protected by the plastic fibrin, is ready at any weak point to escape, to run from the vessels in a fine stream, or to diffuse, in the form of purpuric clot, into the peripheral surfaces of vascular organs or over the surface of membranes.

In one instance in which the purpuric state was connected with serious dropsy, I caught a few ounces of blood flowing from a vein of the patient. The blood had a specific gravity of 1,035, or only 15° above the specific gravity of the ordinary renal secretion of the same patient. The blood yielded no

clots on agitation ; the corpuscles were large, pale, and globular ; the amount of water was increased to 860 parts in 1,000, while the fibrine was reduced, relatively, to 1 part in 2,000.

The eruption which accompanies most cases of aqueous purpura is in some cases not developed at all, although the conditions for its manifestation are strongly present. The patient knows that his blood will flow with dangerous freedom if he prick or cut himself, and he will tell you of members of his family who bleed in a similar way ; but he may not have any eruption, and pass through life suffering from what is called the purpuric diathesis. The reason of this is that the colouring matter of the red corpuscles, and the fibrin is equally diffused through the volume of blood. The blood consequently makes its course freely until some other factor intervenes. A prick, a slight blow, may be all sufficient for this purpose, or even pressure induced by the dress. I had one patient in whom a sudden exposure to cold would bring out a characteristic purpuric eruption. In these persons, if the skin be frozen in a small point by ether spray, the purpuric spot will follow, and I have found this a valuable mode of diagnosis in the obscurer forms of this disease.

The eruption is easily developed by other causes in those who, from the condition of their blood, are prepared for it. Excess of alcohol or excessive mental or physical fatigue will induce it. The character of the eruption where it occurs is distinctive—it is diffuse, irregular, and faint. It partakes of the character of a superficial bruise, but unattended by swelling.

What has struck me often is the immunity with which persons affected by aqueous purpura go through life. They sometimes carry with them exceeding good looks ; they are fairly strong ; and they are usually well nourished. If they suffer from great loss of blood, they recover rapidly when the bleeding has been checked, and even regain colour. I doubt, however, whether in true examples of this disease the blood ever becomes of natural quality.

The remote origin of this example of purpura from extreme fluidity of the blood, will, I believe, be ultimately found to be central and nervous. It is among the most marked diseases of the hereditary type and the hereditary quality of the malady is generally diffused through a number of members of a family to an extent specially striking. I was called a few years since to arrest hæmorrhage after a tooth extraction in

one of these subjects, and I found that four members of the family had suffered from aqueous purpura. One had died from loss of blood from a leech bite ; another had marked purpuric eruption ; two had suffered hæmorrhage from the gums, and had shown purpuric spots ; and my patient all but died from the escape of blood, which was practically uncoagulable, until syncope from actual loss of blood supervened. In two other cases which have come before me in which no decided hereditary tendency could be discovered, the patients—in both cases adults—attributed their disease to mental causes—that is to causes acting intensely on the mind. One attributed the disease to a severe fright occurring in childhood ; the other to sudden and excessive grief. I believe both were correct in their surmise, because they based it on clear and reasonable evidence of facts. But how the blood can be physically modified by mental shock I do not assume to know.

The summary of this condition runs as follows ; There is usually a history of hæmorrhage of fluid blood caused by very slight wounds and restrained with difficulty. There is a history either of hereditary disposition to the disease, or of its induction by some nervous shock or injury. The blood is very fluid when taken from the body, and does not coagulate. The corpuscles of the blood are large, and deficient in central depression. The specific gravity of the blood is low, and the specific gravity of the urine is low. The eruption on the skin is not a persistent symptom, and when it appears it consists of a diffused blotch resembling a bruise, with neither swelling nor hardness. The eruption is brought out by any cause that for a moment paralyses the vascular tension. It is brought out readily by extreme cold. The patients themselves are not, as a result of the disease, in an emaciated or enfeebled condition, and they do not bleed from open surfaces except when the vessels are divided. In other words, their blood does not exude through closed vessels, but it easily flows from a wounded point, as from a prick or the suction of a leech.

If all patients who came before the operator carried with them this history there would be no obscurity. The operator would know with what he was dealing, and would probably think it wise not to accept the risk of an operation. Indeed more than once I have been consulted on the propriety of operating under such circumstances, and on one occasion

gave a verdict against operating, which I had occasion to know saved the gentleman who consulted me the most terrible anxiety, for that patient soon afterwards died from hæmorrhage from a slighter cause than tooth extraction. Unfortunately it may happen that no such preliminary history is supplied, and then we get the true typical case, two illustrations of which I will give—one from the practice of Dr. Roberts, of Edinburgh, most faithfully recorded by him, the other from my own practice.

Dr. Roberts' patient was a Mr. Pen, a man of middle age and full habit of body. He came to Dr. Roberts to have a loose wisdom tooth removed from the right side of the lower jaw. The tooth had three small fangs, the anterior one the largest. The hæmorrhage, not more than usual, stopped before the patient left the house, the alveolus being plugged with lint wetted with camphorated spirit of wine. At half past four of the same day Mr. Pen called again on Dr. Roberts, the blood flowing in full stream from the alveolus. Plugging with lint and firm pressure with a cork was now adopted, together with astringent lotions. By this means the bleeding was staunched, so that the saliva came away from the mouth uncoloured. The patient now informed Dr. Roberts of his history, viz., that he had had a tooth taken out before, and that there was then considerable hæmorrhage, which lasted for three days, but was assisted by the application of caustic; he also reported that his gums had bled to a considerable extent, and often for a fortnight at a time. On Monday morning, one day later, Dr. Roberts was sent for, and found that the bleeding had continued all night, and that there was neither clot in the alveolus nor in the blood which was spat out. Caustics and solutions of lead and alum were now applied with benefit, and for an hour all appeared safe. In the course of the day Dr. Hay was called in, and finding the hæmorrhage still present he applied the actual cautery. Afterwards, with an iron button properly adapted, Dr. Roberts applied the actual cautery, but with no better result. In the act of applying the cautery the second time the patient started, and the under lip was slightly burned. From the wound thus produced blood oozed freely for several days. Attempts to check the bleeding were vain until Wednesday, when the loss was more severe, and indications of syncope supervened. Towards the evening there was some improvement, the hæmorrhage being under control by simple pressure.

Mild purgatives were given in consequence of a considerable quantity of blood having been swallowed. On Thursday there was sinking, and although the hæmorrhage from the alveolus had ceased there was hæmorrhage from the gums and from the left nostril. From this time until December 31st there was improvement, when suddenly there was a change for the worse ; there was slight hæmorrhage from the nostril, gums and alveolus, which continued. The gums were very turgid, of purple colour, and almost covered the teeth ; the features were collapsed, the cheek was discoloured, and all the symptoms of purpuric hæmorrhage were decided. Death put an end to this painfully interesting case on Tuesday, three weeks and two days after the operation.

The case thus recorded is typical, and is of the purest type. Of its kind it is the truest example I have met with anywhere, either in reading or practice.

I was called in the year 1869 to a young lady between sixteen and seventeen years of age. She had enjoyed the best of health : had been brought up in a healthy, natural way ; had taken abundance of outdoor exercise, and had been tended with all the care devoted to an English child much beloved by friends, whose means extended to wealth.

This patient was obliged to lose an upper molar tooth on the left side. The tooth had undergone rapid decay, and all attempts to preserve it were useless. The extraction was easy, and was performed with his usual skill by one of our most accomplished operators of the metropolis. At the time there was rather more bleeding than is usual, but so entirely free was she from any sign of ill-health—there was not so much as an anæmic cast—no notice was taken of the hæmorrhage. The hæmorrhage soon ceased of itself, and gave rise to no symptom either of syncope or of exhaustion.

The tooth was extracted about midday, and all went on well until the evening, when, during the excitement of dancing, blood began to flow from the alveolus. The blood as it flowed gave no signs of clot ; it was of red colour, but thin, and was wanting altogether in plasticity. The loss of blood continued for many hours, until, in short, dangerous signs of exhaustion showed themselves, and on my arrival there was some cessation of the hæmorrhage from exhaustion of the propulsive power of the heart. In this state I succeeded in plugging the alveolus so firmly with styptic colloid on cotton wool that when the patient began to recover the bleeding did not return. Three nights afterwards, during sleep, my patient, by mere

accident, moved the plug in the alveolus, when once more there flowed forth the fluid blood. Happily, again during semisyncope, I succeeded in sealing up the bleeding surface with the same kind of styptic stopping, and by the exercise of extreme attention the surface healed without the recurrence of hæmorrhage.

The patient herself in this case afforded no external evidence whatever of her peculiar diathesis, but her family history told the story. Her infant brother had lost his life by the escape of blood from a small injury to the skin.

The second form of purpuric or hæmorrhagic blood to which I would direct attention I designate as the *saline* type. In this type there is no deficiency of plastic matter in the blood, but an extreme fluidity due to an excess of soluble saline material. The synthesis of this disease was well brought out in my early experiments, in which the blood of lower animals was rendered preternaturally fluid by administering of alkaline salts. The distinguished Huxham observed a similar condition in the human subject in the case of a man who habituated himself to the taking of bi-carbonate of ammonia until his blood become permanently fluid. The same condition has, again, been observed on a large scale in the scurvy produced by too long a subsistence on foods preserved by salt, and especially when under such foods the body has been exposed to extreme cold, as in Arctic exploration. The same condition may also be observed in certain advanced stages of alcoholic disease. Very soon after the introduction of chloral into medical practice and its use by the chloral *habitues*, I met a case of purpuric chloral eruption, a saline purpuric caused, as was easily explained, by the accumulation in the blood of the sodium formate resulting from the decomposition of the chloral in the body. I have now seen four instances of saline purpura so induced.

In these cases the specific gravity of the blood is increased, and the attraction of cohesion in the fibrine is suspended by the presence of an agent which holds the water in too close combination with colloidal matter. In this condition the fibrine the albumen, and the colouring matter of the blood through the membranes, and the exudation of blood at feebly resistant surfaces is easily effected ; hence the bleeding spongy gum in well-marked illustrative forms of this malady. Persons suffering under saline purpura are the true scorbutics of the older school of physic. They supplied the patients whose blood,

when our forefathers drew it, as they usually did, was seen to separate, while it was flowing, into fibrine and serum, just as fibrine separates when we precipitate the corpuscles by adding a saline solution to blood newly drawn.

There is in this form of purpuric disease no necessary evidence of hereditary tendency. On the contrary, the malady is usually caused by error of diet or toxic habit.

The eruption, when it occurs in saline purpura, is more sharply defined as a spot, *macula*, than in aqueous purpura. It is not induced by an injury, but breaks out spontaneously. Often there is no eruption ; but there is always a tendency of exudation of blood from the gum, from the throat, and occasionally from the lung.

The summary of this condition runs as follows :—There is no necessary history of hæmorrhagic or fluid blood, nor yet of hereditary disposition to such hæmorrhage ; but there is always a history of an induced morbid condition from error in diet, exposure to some noxious agent, or disintegration of blood from disease. The blood is fluid when taken from the body, but from it fibrine separates, and the corpuscles are shrunken and crenated at their edge. The specific gravity of the blood is high, and the specific gravity of the urine follows the same rule. The tendency of the blood in these cases is to exude from the soft spongy surfaces, as from the gums ; and if an eruption present itself, it is in the form of maculæ or petechiæ. Transudation of blood by the mucous secretions is not an uncommon diagnostic fact of this type of purpura. Venous murmur is also not uncommon as another point of diagnosis.

I have seen very few examples of hæmorrhage from this class after tooth extraction, a fact easily accounted for on the theory that few operators care to operate under such unfavourable conditions. One instance, however, came before me in which profuse hæmorrhage at the time continued for several weeks, ceasing at last under constitutional rather than local treatment.

(To be continued.)

PRESIDENTIAL ADDRESS
TO THE STUDENTS' SOCIETY, VICTORIA DENTAL
HOSPITAL.

By G. G. CAMPION, L. D. S.

Gentlemen, Allow me in the first place to express my sincere appreciation of, and thanks for, the honour you have done me by electing me as your President for the ensuing year, and in doing so I feel that it is unnecessary to ask your kind indulgence for the many deficiencies which will, I fear, show themselves ere the year be ended ; for had I not been previously assured of this it would have been impossible for me to accept the responsibilities of the position in which your kindness has placed me.

A very old friend of mine who combines in his character a good deal of the wag with perhaps a trace of the cynic, is fond of saying that at the present time we are in some danger of being done to death by Societies, and that the only one that he ever feels any inclination to belong to is an Anti-society Society. His meaning I take to be that nowadays there is a danger that the sense of personal effort and personal responsibility should be in many people enfeebled by the idea that everything to be done effectually, must be done by concerted action. This, however, is not an objection that touches a Society which, like ours, exists solely for mutual instruction and self-improvement. For, I take it, we do not here aim at being very original in our work or expect at present to do much to advance our particular branch of medical science. To few indeed, and we may safely believe to none of us, is it given to add anything to the volume of human knowledge in the days of technical studentship. What papers we may write and what matters we may discuss are taken up and treated, not that we may illuminate them, but that they may help and instruct us. And the training we may thus obtain has a value not easy to estimate in relation to the more serious work of our after student life. For it is not when our diploma is obtained and our names entered in the Dentists' register that our student days come to an end ; they are, or should be, then but beginning in real earnest, to close only with our life. Now is, so to speak, the period of our professional childhood, and just as a man's position in after life depends largely on the education which has been given him in his childhood, so will our

future position and our use, both to our patients and to our profession, depend largely on the quality of training which we are now giving ourselves.

And if we ask in what way active membership of such a society as this may benefit us the answer is not a difficult one to find. In the mere talking over business matters in the council and the society many things occur to show, if we will but notice them, from what different points of view even the simplest matters may be approached, and how many-sided and difficult are questions which often at first seem simple and easy of solution ; and in the discussions which take place, on whatever subjects, we may learn the most difficult but most necessary lesson ; how to enter into, and sympathise with, and perhaps even to finally adopt, views differing widely from our own.

In the preparation of papers much is to be learnt. In doing this we have to consult as many authorities as we can find on the subject which we propose to discuss, and may here see something of the difficulty of writing on any subject in an accurate and scientific manner. We consult for example two writers who both treat of the same subject, and find, as we often shall, wide differences between them. They seem in many cases to contradict one another. Are these contradictions apparent or real? If apparent only, how can they be harmonized, if real, how do they arise? Is it only that the subjects have been treated from different points of view, or is it that in one case the writer has failed in the essential but all too infrequent qualities of logical sequence and persistent accuracy. In reading two books or papers on the same subject the one helps us to review the statements and arguments of the other, and to see its defects and failures. The errors of the one are thus less likely to escape notice, while the truths are more strongly and vividly impressed on the mind. Or see again how useful a Society like this may be in helping us to cultivate the power of speaking, of expressing our thoughts with order, ease, and significance, a faculty which is for all a most difficult one to cultivate, and even the most moderate amount of success in which can only be obtained by constant and persevering practice. It is said of C. J. Fox, who was perhaps the greatest parliamentary debater that this country has yet seen, that when asked one day as to the secret of his success he attributed it solely to practice. " During four consecutive sessions of Parliament," he said, " I failed to address the House on one night only, and one of my greatest re-

grets now is that I didn't make a speech on that night too." Unwearying and unceasing pertinacity is in most fields of active work the great secret of success. Indeed, genius itself has been said to consist for the most part of an infinite capacity for taking pains. Read some of the works of Charles Darwin, and see this is exemplified in the life of the man, who more perhaps than any other, has revolutionized the thought of the age.

I said just now that the greatest help we may get from our Society will be by way of self-improvement. It is more by the methods and habits of study which we may thereby learn, than by the actual knowledge we shall gain that its truest value will be achieved. And this is true also of a great deal of the work of our curriculum. The utility of a scientific training, broad in scope, and exact in its requirements, lies not merely in enabling us to employ in practice for the benefit of our patients all the knowledge which has previously been acquired, but also in teaching us how to use in a complete and scientific manner all the opportunities which practice affords for adding still further to our knowledge. It is in this way perhaps that what are called the scientific portions of our curriculum bestow their greatest good, for at this time of our life we are not merely learning the details of our purely professional work but also surely, if unconsciously, training and strengthening our minds and forming our habits for life. Many of the details of Anatomy, Physiology, and Chemistry, which we learn for our examinations are of little or no direct use to us in the life of practice, they do not help us to fill a tooth, adjust an artificial crown, or perform more perfectly any of the difficult operations which modern dentistry requires. But they are certainly invaluable in the training of the mental powers, in engendering habits of rigid accuracy in details, which is of the very essence of science and of scientific work of all kinds. To think no part of our curriculum of value which has not some obvious and practical bearing on what will be by-and-by the daily work of our life is a grievously fatal error. We must take the scheme of work which senates and councils have drawn up for us and do our best with it, being sure that the more pains and thoroughness which we bestow on it the better shall we be fitted in after years both for practical study and for scientific practice. For scientific study may always go hand in hand with first rate practical ability, and even work which seems at first sight of so prac-

tical a kind as to be far removed from science as we see it in the laboratory or the text-book, may, if pursued in an accurate and systematic way, be made not only far more interesting in itself but of great and lasting benefit to ourselves and to others.

Take a simple case which illustrates this point. During our two years dental hospital practice we are engaged amongst other work in the treatment of certain cases of irregularity. Some of these are simple and soon completed--cases perhaps of pushing out an instanding incisor, or pushing in an outstanding canine after the extraction of a bicuspid. Some are more complicated and require longer time, not infrequently ending after the expenditure of much time and trouble, in the patient becoming discouraged and ceasing to attend. With other cases we are more fortunate and able to carry them to completion, and at the end of our two years we have successfully treated three or four cases, not perhaps very complicated ones, but still of average difficulty. We have also heard opinions on and seen the treatment of other cases in progress round us, and learnt certain elementary rules as to teeth moving more easily in certain directions according to the position of their roots, of the second molars moving forward in the alveolar process after the extraction of the first, and of the patient's age having something to do with the treatment of any given case. At our examination we give our opinion on one or two cases submitted to us, and finally enter on practice with the idea that we are, at any rate, fairly qualified in this particular branch of our work. And yet it is now only that a real knowledge of the difficulties of the subject begins. We find that many of the ideas we have formed are not quite as correct as we believed, and cases occur which do not yield to such treatment as from our experience of other cases we should expect; that indeed two cases apparently quite similar may differ widely in their amenability to treatment, and that a greater allowance has to be made for the age of the patient than we at first thought necessary. Or again we find that some cases will almost or entirely correct themselves by timely and judicious extraction, while others prove intractable and obstinate, and seem to defy all our efforts to improve them. Other questions too seem to crop up. In what way, and to what extent does the fact of an irregularity being inherited effect its treatment? Is there any connection between the density of the teeth themselves and the density of

the alveolar process? If so, what is approximately the relationship between them, and to what extent does this influence the treatment? And when we add to questions like these such considerations as are involved in the sex, type of face, and facial expression of the patient, we have a number of points, all of which may have to be taken into consideration in any one case and yet whose relative importance may vary greatly in cases apparently similar. Now at present I know of no work or text-book from which detailed and accurate help of the necessary kind may be obtained. Much of the knowledge must at present exist in the experience of some practitioners of long standing who have taken an interest in these cases, but for them to impart it, even to a small extent, would be difficult, and in any complete sense impossible. And yet the knowledge which is here wanted is really within reach of all. It requires simply the careful tabulation and illustration of cases which are daily occurring in practice, with full notes on the age and physical condition of the patient, type and quality of teeth, complete figures and description of the apparatus (if any) employed in the treatment, and a carefully dated series of models to fully illustrate each case. No doubt the knowledge to be thus acquired would be incomplete, but it would be better than any that we have at present, or that we are likely to get by any other means, and its importance to a young practitioner cannot easily be overstated.

I have taken this illustration because it deals with a class of cases which are constantly presenting themselves in practice, and are, without any great difficulty, open to all to study. But the same method can and should be applied to all kinds of work, whether in practice or in the laboratory.

We sometimes hear, perhaps, when asking someone to read a paper before some society, that there are hardly any matters left to deal with; that every thing has been written, rewritten and over-written; and that on no subject which is of any importance is there anything left to be said. It would be difficult to find greater nonsense in a year's issue of the Comic Papers! Look at dental caries itself. During the last decade we have learned more as to its true nature than in the two previous centuries. We are able now to even produce it at will by artificial means. And yet our knowledge of it is far indeed from being complete. A belief is pretty general that the disease is becoming now more widespread and severe. If this is true how is it to be accounted for? What portion of

the increase, or of the disease itself, is due to defective formation of the teeth, and what to conditions in the mouth or system which favour fermentative changes? Some answer to these questions is wanted before we can even dream of any rational or systematic efforts at prevention, and yet surely at nothing short of prevention of disease ought medical science to rest. Or consider how little we know of Erosion or what is commonly, though not very scientifically, described as Riggs' disease, or our ignorance of the microscopic changes which might be seen in different pathological conditions of the dental pulp. I need not multiply examples, these are enough to show that it is not so much subjects as workers that are really lacking in these and other similar fields of enquiry.

Now here it seems to me we find ourselves under a real and serious obligation. In entering a pursuit or business of any kind a man is actuated mostly, I take it, by the necessity of obtaining a livelihood, but in becoming members of a profession like ours whose whole aim and purpose is to assuage the sufferings and remedy, so far as it can, the disease and defects of mankind, each of us is bound to add so far as he can, to the knowledge of disease, in the hope that by-and-bye we may be able to deal effectually with conditions that are at present beyond our control. This is surely not only an obligation but should also be a privilege and a delight. But this is not all. As members of and units in one common profession, we have duties to it and to one another which are incumbent on all, and within the power of all to fulfil, to raise it by common effort, mutual encouragement, and mutual help to a high position among the cultured and useful professions of our time. At present it can hardly be called a profession at all. It is true that we exist as a corporate body by virtue of the Dentists' Act and the Dentists' Register; it is true also that our position and influence have risen during the last ten years with a rapidity hardly paralleled in the history of any profession around us. But how much still remains to be done in fostering the truly professional as distinguished from the commercial spirit in dentistry, may be seen in the columns of our newspapers, and at many of the corners of our streets. And in the work of building up a regenerated profession each one of us has his part. People naturally form their notions of a profession from the character and bearing of those of its members with whom they are more or less immediately brought

in contact. It follows, therefore, that each one of us has the power, according to his working, of doing something to raise to a higher level the position of the profession of his adoption ; of adding, as it were one more stone to the slowly rising foundation of a more useful, more liberal, and more professional profession than ours can boast of being at present. Let us see to it then that we individually realize this power, and strive so far as we are able to fulfil the obligations it imposes, remembering always in the words of Sir James Paget "where there is power there is duty, and where there is duty there too is responsibility both to God and man."

PAST AND PRESENT DENTISTRY.

By Mr. W. HITCHON.

DENTISTRY, like all progressive sciences, is subject to variations of progress and development. Looking back, we are indebted to Herodotus, the Greek historian, for the information that the Egyptians practiced the art of dentistry, but whether a rational dental or medical pathology was known to them we have no means of discovering. Herodotus says in one of his books called "Euterpe" that the art of medicine was divided among the physicians, each one applying himself to one disease only, some for the eyes, others for the head, others for the teeth, and others for internal disorders, &c. This is the only statement made by Herodotus of the treatment of the human teeth. No mention whatever as to the manner of treatment either of diseases of the teeth or other diseases. From what we can judge, their art in treating disease could not have been very scientific, consisting in a great many instances of charms, talismans, amulets, and votive offerings. As for example, the herb Elecampane was good for soreness, and wagging of teeth. Cedar oil was supposed to split and extract the teeth. Remedies for toothache which were inserted

* A paper read before the Liverpool Dental Students Society.

into the ears of the sufferer, were ashes of the skull of a dog, which had died mad, mixed with Cyprian oil, earthworms decocted in oil, bugs found in the mallow ; ashes of serpents burnt with salt in a jar ; and mixed with oil of roses. Any sort of excrement appears to be useful, especially that of birds, mice, and dogs, various mixtures were inserted into the teeth themselves by means of wax ; such as grit found in the hollows of snail shells, spiders captured with the left hand and rubbed down in oil of roses ; bones found in the deposit of dogs, teeth taken from live moles, or dogs, and tied on ; the heart of a snake ; or a whole mouse chewed twice a month. All these were supposed to give freedom from toothache. Among the ancient poets one finds frequent mention of the teeth. Ovid in his "Art of Love" forbids picking the teeth in company, and he mentions that the odour of the mouth cannot be covered by perfumes, and therefore recommends and very wisely, persons so affected never to approach too near those they are addressing, especially when the stomach is empty. Would that the "Art of Love" were more widely read.

It does not therefore appear at this period of the world's history that surgical dentistry was practised to any extent, and the circumstance that no instruments of this description have been found among the implements discovered in the tombs of Egypt, would indicate that proficiency in this art could not have been very great. It may be inferred that a people capable of producing so many stupendous and imperishable monuments were equally capable in other directions of culture. This, however, does not necessarily follow, for constructive art is not incompatible with the grossest superstition. Mankind built temples and embellished them long before they constructed an alphabet. However this may be, their ideas concerning the development of this science were crude. Nature, herself, has revealed her laws of development by means of her monstrosities. The deviations from the law having revealed the law. This subject is of very great interest, and one that has not been sufficiently studied. One feels with regard to it something like "Topsy" in Uncle Tom's Cabin. You remember when she was questioned as to the reason of her existence, she said she had "just growed." So it is with monstrosities, they grow and it is very difficult to find the secret of their growth ; with this reference I must pass on. Record shows that at a very early period devices were employed for

filling vacancies occasioned by the loss of natural teeth : that files were used to remove the rough edges and surfaces, and that cavities of decay were often filled with lead to prevent breaking the teeth in the attempt to remove them. We may easily surmise that some one who had filled a cavity for the purpose named failed to extract and found afterwards that the tooth remained without further decay, thus revealing by accident the possibility of preserving the teeth in this way and of bestowing great benefits upon the human race. The tenth of the celebrated Greek laws of the twelve tables relating to funeral ceremonies has, among others, this direction, "Let no gold be used, but if anyone has had his teeth fastened with gold, let it be lawful to bury or burn that gold with the body." This no doubt refers to ancient bridge work. At last it convinces us that something very nearly resembling modern bridge work was made use of in those days. The use of gold as a material for filling teeth marked an epoch in the history of dentistry.

Although the methods first used in its preparation entailed much labour and patience, yet its many valuable properties were soon known. Comparatively speaking, however, very little was known at this period of the art and science of dentistry. As we advance in our researches, we find that up to the last century no progress has been made worth mentioning. Our dental ancestors were soon called upon to battle against the encroachment of quacks, and I am sorry to say the profession of to-day is not free from the same. (Sequah for instance). Then dentistry, as a profession was open to any one. In fact an adventurer in want of a means of livelihood had nothing else to do than get together a few instruments, a little broken English, a considerable quantity of effrontery, a French name for himself, and a Latin one for the material with which he "renovates" teeth, to commence practice as a dentist and astonish the world by means of flaming advertisements in the newspapers, placards on the walls, and handbills in the streets, in all of which the advertiser with original modesty, informs the inhabitants of whatever town he is for the time located in that he is decidedly the most extraordinary personage in his way that ever honoured them with a visit. Though this to a great extent has disappeared, yet the only seeming requirements of a professional man at present existing in the crowded and busy state of society, is to be well known, or to be long established. What the present act will accom-

plish the future will tell. At present the young recruits have a hard fight and one necessitating a strong pull and a pull altogether before the field is cleared of such as the Dental Supply Co. The Dash Dental Co's system of dentistry, &c. With the revival of learning as a whole our profession took new life. Pierre Fauchard has been called the Father of modern Dental Surgery, and following close upon him the immortal John Hunter,

Again another century and John Tomes saw the light. In the last century artificial teeth were constructed from a solid block of ivory, obtained from the sea horse, and carved to represent the missing teeth, some of which we admit were exceptional works of art, but these of course are a few exceptions, then again the natural teeth used were taken from corpses, or even from the living men, and mounted on gold, silver ivory or boxwood. (A case of natural teeth mounted on gold was here shown dating back to 1739.) Measurements were taken by means of compasses of those parts of the jaw for which the artificial teeth were required and by the indications thus obtained a piece of bone was cut into an approximate adaptation to the space to be filled. This state of things continued with more or less elaboration of detail until the introduction of mineral teeth, poor things at first very like beans in shape, and of the colour of a china teacup, but improved in one way or another till some of them at present are well nigh perfect. Twenty five years ago the comparatively few who were really expert operators, especially when having to use the key, were well known. They could then, like the prohibition party, stand up and be counted but now every city can point with pride to so many skilful dentists that individual excellence is almost lost sight of in a multitude who are similarly endowed. Manipulative ability to insert good fillings is not the only accomplishment of the dentist who has kept up with the profession. He has acquired a better knowledge of diseases of the mouth and teeth and a better acquaintance with the medicines suitable for their treatment. It has been said that not many years ago the outfit of the general practitioner of dentistry for diseases of the teeth was composed of Iodine and Creosote. The introduction of Amalgam the Amalgam War, and the animosities which it engendered, have their place in the history of dentistry as much as the "Wars of the Roses" in English history. The last 25 years has seen revivals of the contest and its creeds are still a subject of discussion. The

adaptation of vulcanite as a base for teeth effected another revolution in the dental world. It was a grand discovery, inasmuch that it placed within the reach of all what had hitherto been an expensive luxury, obtainable only by the comparatively wealthy.

But the introduction of vulcanite had its dark side as well as its bright one ; for as its manipulation requires but little skill, in the hands of one who would be contented with fourth rate results it was the means of introducing into the profession hundreds of ignorant quacks. However, time will not suffice for me to enumerate the many valuable inventions that have come to light during the past few years. They seem indispensable now, and it is hard to realize that excellent and durable fillings were made many years ago by the better class of operators without their aid, but such is the fact. The Dental Engine has been evolved from the "Merry drill" a multitude of crowns from the original pivot tooth ; many devices for consolidating gold have succeeded hand-pressure and hand-mallet ; methods for separating teeth, and for preventing the ingress of moisture, &c.

The filling of root canals in teeth, a practice which must have been recognised long since as desirable and known to be preventive of trouble, was in many cases hardly possible before the introduction of the Dental Engine. Imagine the preparation of a second molar, a cavity in the distal surface extending to the gum and not involving the crown, but exposing the pulp. Who of us would feel like undertaking such an operation without the engine, and its equipments ? and many other operations would be equally difficult. Bridge-work has been brought into prominent notice.

Gold and porcelain crowns have come into general favour, and serve an excellent purpose. Dr. Morrison (who is the real inventor of the gold crown) says that he thinks the crown business is being over done, that he believes some of the enthusiasts are cutting off teeth that a conservative and skilful dentist might fill to advantage. Be this as it may, crowns are a vast improvement on the old methods, and in fact everything at the present day will compare favourably with the past. Fifteen years ago, no organised scheme of dental education existed, no hospital was to be found at which a student could learn more than the roughest operations of dental surgery, no society for discussions and the advancement of our special knowledge. Within this short period a-

immense deal has been effected, we are almost saying everything; schools of dental surgery have been established, at which many students are at present being educated. The general public we think, have as yet far too little appreciation of the amount of study and ability required to make a really good dentist; they are inclined to think that one dentist is much as another, and that the calling is one so purely mechanical that they even esteem it lightly; while there are few who even know the distinction between a qualified and an unqualified dentist. No doubt most of us in our course of study when explaining such, to our friends receive the reply "I never thought you had to do all that to be a dentist."

In conclusion, I must say that a profession which is sparing neither trouble, time, nor money, to elevate itself, and take the stand, which the acquirements of educated dental surgeons entitle them to, deserves and has earned the right to sympathy and help, not discouragement, and will in future years ring the death knell of past dentistry, and its workers.

PULP PROTECTION BY CAVITY LINING.*

BY G. F. CHENEY, D.D.S., St Johnsbury, Vt.

IN presenting the subject of pulp protection, I aim rather to bring out a discussion of a much neglected subject, than to offer anything particularly new. I am sure most of us see evidences of this neglect in our daily practice. Neither do I intend to discuss pulp capping, but protection of unexposed pulps from thermal influence, through metallic fillings by cavity lining.

It is a well known fact that thermal influence will account for the death of thousands of pulps under gold and amalgam fillings, and this is the beginning of a series of disturbances which, in time, result in abscesses.

I have seen so many abscessed teeth where, upon removal of the filling, sufficiently apparently sound tissue was found to have fully protected the pulp, that I am inclined to believe some protection should be used in this climate under most

* Read before the Ohio State Dental Society, held at Columbus, Oct. 1890.

of our metallic fillings, especially in approximal cavities of lateral incisors and bicuspid's where the pulps come so near the surface. Without doubt if a properly inserted lining had been used in these cavities the pulps could not have been anything but preserved. Of course it is possible that in a few instances the death of the pulp may have been caused by violence, like a blow or in biting hard substances.

In teeth where there is the slightest chance for the pulp to become injured by thermal or electric influences the safe course is best. Too much thought and care cannot be given to the protection of the pulp. We must always bear in mind the larger proportional size of the pulp in early life, the possibility of its occupying an abnormal position, the chances of there being a crack or fissure extending to it, and of a point of it coming nearly to the surface.

We must also be able to diagnose the difference between sensitive dentine and tenderness of the pulp. Sensitive dentine responds when excavating over a considerable portion of the cavity walls, does not respond to simple pressure, while, when in near proximity to the pulp it responds quite as readily to pressure as to the cutting instrument, and is confined so completely to a single point that the danger is at once suggested to the operator. In deep seated cavities the necessity of caution becomes greater and the danger of intruding upon pulp territory increases and, unless carefully protected, thermal changes may prove a disturbing influence which will give rise to more serious trouble.

For the protection of the pulp against these influences I should recommend something with as little conductivity as the case will admit. Scores of different materials have been in use, of these I will only mention a few, viz., varnish and the various zinc plastics, oxyphosphate, oxysulphate, and oxychloride of zinc. To use varnish is the most useful. I use the sandarac gum dissolved in alcohol and quite thin. The effect of varnish lining is to leave upon the cavity walls a thin semi-opaque whitish film which is non-conducting, non-irritating, insoluble and more in harmony with dentine than any metallic substance, and can be used in any cavity no matter how shallow, because of the small amount of space it occupies. The operation of varnish lining is very simple, having the rubber dam adjusted and the cavity properly dried, a small pellet of cotton is dipped in the varnish, conveyed to the cavity touching the bottom and walls. Five or ten

minutes should be allowed for hardening, which can be hastened by hot air. In some cases I take a piece of tissue paper, dip in the varnish and place over the cavity bottom.

In approximal cavities of the posterior teeth, especially those extending below the gum margin, we sometimes find ourselves in close proximity to the pulp with barely depth enough for anchorage to the filling, I find nothing else will take the place of varnish in these cases for a lining.

Oxyphosphate of zinc is an excellent liner, it is adhesive, does not shrink, and is indicated where the walls of the tooth need strengthening. In deep-seated cavities where undercuts exist, if the enamel is strong it need not be cut away, for when the cement is carefully packed in its place it forms a support. When hard, almost equivalent to dentine, a cavity cut in it to a depth a little greater than enamel, reduces the final filling with gold to an operation of the simplest character, as this cavity has a hard, firm base of cement and a boundary of cement and tooth substance, or of the latter alone. When using an oxyphosphate in deep-seated cavities we must not forget the necessity of protecting the pulp against the effect of phosphoric acid. This can be done by varnishing the bottom or by using a little oxysulphate of zinc, or a pad of oxide of zinc and oil of cloves.

Oxyphosphate of zinc* is probably one of the best pulp protectors which has ever been used, is easy of adaptation and perfectly non-irritating, alike to sensitive dentine and to the dental pulp, and is probably the best material to be used where the pulp is nearly exposed. Place a small amount of the thinly mixed oxysulphate over the bottom of the cavities, allowing a few minutes to set, then finish the lining by covering it with oxyphosphate of zinc.

Oxychloride of zinc, although used quite extensively, is not a reliable liner except when used in small quantity, it being a notable shrinker when used in bulk, which makes it very much inferior to the phosphates when we wish a strengthener for the cavity walls. It is irritating and should not be used near the pulp, except over varnish or oxysulphate. It has been said that oxychloride of zinc permits of no decay in adjoining tooth structure.

In 1888, Dr. Kells, of New Orleans, La., by the use of an electric instrument demonstrated before the joint meeting of

* Flaggs's "Plastics and Plastic Filling," page 161.

the American and Southern Dental Societies, at Louisville, Ky., the conductability of heat and cold through filling materials.

He says : These may be divided into classes, the metals coming first as the best conductors, the difference between them being slight. Next comes the cements, the oxyphosphate being a shade poorer than the oxychlorides ; then the gutta-perchas come last although far from being a non-conductor, not even equaling enamel. He further says that the oxyphosphates and oxychlorides are such comparatively good conductors of heat and cold that they should not be used alone for capping pulps exposed or nearly exposed. That such pulps should be protected by a layer of gutta-percha fully 1-16th of an inch in thickness when possible.

Gutta-percha I have used very little and hardly feel like saying much about it, but from what little experience I have had with it I should be afraid to use it in such a quantity as Dr. Kells recommends for fear of expansion ; would rather depend upon varnish.

One other combination I wish to speak of, although perhaps not strictly belonging to the subject.

Some four or five years ago I filled a bicuspid approximately with amalgam not thinking of any possible chance of thermal trouble. A few days later the patient returned, saying she could not take cold water or breathe cold air into her mouth without pain in this tooth. I tried several remedies but to no avail, the trouble still continued. Finally I drilled into the crown making a small cavity which I filled with gold in such a manner that the gold came in contact with the dentine of the tooth and the amalgam filling, the trouble ceased. Since then I have treated one or two other cases in the same manner with equally good results. In a paper read by Dr. Stockwell before the Odontological Society of New York, he explains this action thus : In regard to the question of thermal influences there is no doubt but that Robinson's foil is a better non-conductor than gold ; and this would in part at least account for the immediate favourable results. But there can also be little doubt that the galvanic action set up by this combination taken in connection with the fluids of the mouth, lends our impulse toward the removal of those physiological sensations resulting from thermal influences. There can be no doubt at all that the combination of amalgam and gold when placed in contact with the teeth and fluids of

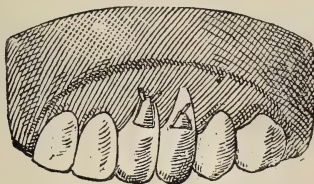
the mouth will create an electric current, and I am assured by competent authority that when a tooth is so filled the current will flow in the following direction, namely, from the amalgam down through the body of the tooth to the pericementum, from it to the saliva, and from it or through it to the gold.

All this proves to my mind that combination fillings of gold and tin, or gold and amalgam, should be classed among the pulp protectors.

A MEANS OF HOLDING THE RUBBER-DAM WHILE OPERATING UPON CAVITIES IN LABIAL AND BUCCAL SURFACES.*

By C. R. BUTLER, D.D.S., Cleveland, O.

A great number and variety of clamps and other devices have been tried and used by operators, but in many cases to the very great discomfort of the patient. When there is a high degree of sensitiveness of dentine there is oftentimes very great pain, and sometimes almost beyond endurance. Even if the clamp remains steady after being placed in position, it is not always possible to carry the rubber-dam over it. Most operators are able to reach ordinary cases, but the question is how to reach the desperate ones that are occasionally presented. It is to this last variety of cases that I propose to call attention for a short time, and if a method can be suggested to overcome this difficulty, then a long step has been made in securing labial surface cavities against moisture while being filled.



* Read before the Ohio State Dental Society, held at Columbus, October, 1890.

The illustration here presented is from a case in practice which came under my hands about a month ago. Several fillings of cavities of this kind had been made by other operators, and more was needed. The patient expressed much dread of the clamp, but when told that the clamp would not be used said, "Well, I can stand anything else." In this case I put in two small screws, as shown in the cut. One is quite sufficient in most cases.

If the drill is nicely gauged to the screw wire the screw will become firmly attached even in a shallow. Set the screw as near the border of the cavity as may be, and this should be done before the excavation of the cavity. The screw should be set sufficiently distant from the border to avoid the liability of checking the enamel. After the filling is introduced the protruding portion of the screw is cut off and finished upon the surface as a small filling would be. I prefer with the hand drill. Never use a screw tap. Let the thread upon the wire be sufficient for cutting its way into the dentine.

The iridio-platinum or gold wire is hard enough to cut its way into the tooth bone, and the smallest size wire made is the best for the purpose. The small drills made by S. S. White Dental Manufacturing Co., with limit shoulders are the safest for the operator if he is not able to make them himself. After having introduced the screws, place the dam on the tooth slipping its edge over these screws before beginning to excavate. It is well to dip the end of the screw in phosphate cream with a trace of creosote added when ready to put it in place.

The illustration accompanying this will illustrate the principle and mode of procedure without further description.

If anyone objects to the engine, set it aside and use hand instruments. Experience soon teaches the patient that burs are preferable to excavators. The engine gives less, if any, pain. The secret lies in the fact that after the rubber-dam has been adjusted, the cavity carbolized and thoroughly dried, a small sharp bur is first used, and then larger ones until the requisite size is reached. They are rapidly rotated, but not held in any one position long enough to heat the tooth, and in this method is found the simplest and best pain obtundent now extant. Pain will almost invariably arise from use of large, blunt, or dull excavators or burs.—W. E. BOARDMAN, D.M.D.
(*Cosmos*.)

British Journal of Dental Science.

LONDON, FEB. 2nd., 1891.

CUI BONO ?

MOTIVES are always curious things, it is sufficiently difficult to analyse the cause and reasons of our own actions, but if we attempt to divine the origin of the actions of another, the possibility, or rather the probability, is we shall cut but a sorry figure before the public. We shall, therefore, make no attempt to find the motive that led Mr. S. John Hutchinson to write his recent letter to the *Lancet* (which will be found on another page,) apropos of a few comments which our contemporary made on the recent changes in the Dental Law of Italy. We shall not attempt to find the motive, but we certainly wonder what it was, and marvel not a little at the frame of mind that produced it. In our issue of November 1st last, we published the text of the decrees respecting the practice of Dental Surgery recently promulgated in Italy, so that our readers will be already in possession of the facts. In the issue of December 20th, the *Lancet* commenting on this Act, which insists on a medical qualification, said :—" This is indeed a progressive step, and we trust that France in framing the projected Dental Act will follow upon the same lines and not make dentistry a separate profession, and that those countries where the latter position has been taken up will before long insist upon the higher standing." Seeing that the medical profession is always grumbling because it does not enjoy as many social distinctions as the Legal Profession ; that the Law Lords grumble because they are not of

the "old Nobility" and these, in their turn, because they are not reigning Princes, whilst the princes would like to be Emperors, though, we are told, these go about longing to be "simple healthy peasants"; we say, seeing these things are so we may, perhaps, think the phrase "high standing" unhappy and somewhat meaningless, nevertheless we cannot understand the letter which these remarks called forth from Mr. Hutchinson. First, we notice that Mr. Hutchinson promptly puts the cap upon our head and proclaims that it fits. His letter admits, nay urges, that Dentistry shall be a separate profession. We may here notice that this idea has grown of late, there was a time when the leaders of our Profession were eager in claiming Dentistry as a branch of Medicine, now many seem to have changed in their ideas. We cannot see how Dentistry can claim to take rank beside the other specialities of Medicine and Surgery if it is the avowed policy of its leaders rather to deprecate than to urge taking the full curriculum. It is perfectly true that if a man does this and at the same time qualifies himself in the various details of the Dental Art, he does far more work than does an ordinary medical student, but we should compare ourselves not with these but with Ophthalmic Surgeons, who having become qualified in general work, must spend years in special hospitals or departments before they are in any sense entitled to the term "specialists." To say that "every dentist whose means, whose time, and whose capabilities will allow him" shall take the "highest degrees in medicine and surgery," but, at the same time, to object to making this compulsory is illogical. If a man is as good a dentist, not only mechanically but intellectually without, as with, the medical diploma, then the man who takes it is wasting his means, his time and his capabilities. We know there are many men holding only the L.D.S. who are as good dentists, and perhaps better, than some who hold these "highest degrees," but it must be acknowledged that these though not holding the degrees, yet have acquired the knowledge which would have enabled them to gain these, had it been compulsory on them to do so.

Time and money are the same thing, and if a man has taken advantage of his mechanical training he can perfectly well make his own way if he will give himself the time ; and we are sure that anyone in touch with students will know perfectly well that this is one of the flimsiest of flimsy excuses with which some try to cloak their laziness and lack of energy. We can far better appreciate and understand a man who says he does not believe in taking the full medical curriculum, than one who puts forth this pretext as a reason for not doing so. We do not remember to have heard "lack of capability" ever advanced as a reason, though no doubt it often is one, but we do not fancy that men will feel any great debt of gratitude to Mr. Hutchinson for putting this in black and white and so, by inference, classing Dental as inferior in intellect to their medical fellow students.

The *Deutsche Monatschrift für Zahnheilkunde* publishes a balance sheet of the receipts and expenditure of the Dental Section of the late Berlin Congress. The receipts amounted to £366, which was made up of subscriptions from the various Dental Societies of Germany, and by private donations. The German Dentist's also paid for their tickets for the dinner, though all foreign ones were invited as guests. The expenditure amounted to £331, of this, the principle item was the sectional dinner, next comes the steamboat excursion to Müggel-schloss, and then the garden party. The balance of £35, is partly returned to the donors, and partly handed over to the fund for the widows of German dentists.

THE report of the physician in the charge of the Ningpo Missionary Hospital for the past year contains some interesting observations on tooth drawing in China. Dr. Daly remarks that Chinese teeth are much more easily extracted than those of Europeans. The native dentists are said to possess a wonderful powder, which is rubbed on the gum

over the affected tooth ; after an interval of about five minutes the patient is told to sneeze, whereupon the tooth falls out. Dr. Daly has offered a reward of 100 dols. to any one performing the operation in this way in his presence, on condition that he is allowed to choose the tooth and examine the mouth before and afterwards. So far no one will consent to perform the operation on these conditions.

Mr. LAWRENCE-HAMILTON, M.R.C.S., calls our attention to the waste of good food consequent on a Ring in Billingsgate Market, destroying large quantities of fish, rather than let it go below a certain price. These abuses have been known for years, and undoubtedly there is a crying need to have our markets placed under the control of our municipal bodies.

OUR readers will notice that we publish in this issue a résumé of the German Dental Journals. We hope to be able to print a similar one of the French Dental Journals and to continue to publish such articles, if possible, alternately. We believe this is the first attempt to present English Dentists with a record of the current dental journalism of these two countries, and as such, we hope, will be welcome. Journals, with all their imperfections, are yet the means of spreading records of work done ; it is therefore imperative that a man should be kept in touch with their contents ; this will be the object of these articles.

THE fact that sixteen candidates should present themselves for the five vacancies at the London Dental Hospital speaks well for the honour in which a position on the staff of this Hospital is held. It also shows the great increase in the number of " fit and proper " dentists there has been of late. It is said that " supply is always equal to demand," we sincerely hope that in the matter of Dentists demand may be fully equal to supply.

Manipulative Miscellany.

All new instruments or articles that it is wished to have described under this heading, are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

GEAR'S SHADED PINK RUBBER.

The Dental Manufacturing Company send us a sample of this beautiful preparation of rubber which is manufactured solely by them. As with other "Pink Rubbers" it is intended to be used only for coating purposes, and as such it certainly gives a more natural appearance than any other rubber we know of. The peculiarity lies in its "shading," as, indeed, its name implies. It is sent out in strips of varying width, from 5-16ths. up to 5-8ths. of an inch. One margin of a strip has a whitish pink colour which gradually passes into a deeper pink at the opposite edge. The effect of this is, that when made up (the whitest edge being, of course, packed round the necks of teeth) a resemblance is produced to the free margin of the natural gum with the roots of the teeth showing through, thence it passes into the deeper shades. The beauty is considerably heightened by the "solarizing process." The appearance of a denture may also be considerably improved by coating the lingual surface of the palate, as well as the gum, with this rubber. This may be effected either by vulcanizing the piece for a quarter of an hour and then laying over the lingual surface a layer of this pink, or the whole packing may, with care, be done at once. In either case a polishing plate should be used, as if much filing or brushing be called for, after the piece is vulcanized, the base plate will inevitably be exposed, and hence the appearance of the piece would be rather spoilt than improved. In using the strips of

rubber, for this purpose the white edges of the strips should be placed in contact, but the rubber sent us is really too thick for the purpose, it should be much thinner and made in pieces sufficiently large to cover the whole palate.

The rubber vulcanizes at the usual temperature, and is packed in boxes of assorted sizes, price seven shillings and sixpence.

Abstracts of British & Foreign Journals.

THE GERMAN DENTAL JOURNALS.

The *Deutsche Monatsschrift für Zahnheilkunde* for January 1891, contains among its original articles one on the case of "A REPLANTED TOOTH AFTER NINE YEARS" by WEIL, of Munich. Weil maintains, that replanted teeth, by a process of resorption of the uniting bone, usually loosen, and have to be removed, even though this may be delayed some years. Scheff has opposed this statement, and Weil publishes this case as supporting his own contentions. In 1881, the patient, a girl aged 18, knocked out the left upper central whilst playing at "Blindman's buff." She was not seen till the next day, 22 hours after its loss, but having kept the tooth and as it was uninjured, Weil determined to replace it. By sawing off the tip of root, he removed the pulp. Several small splinters of the alveolus had to be removed, but a fractured portion of the labial alveolar wall was allowed to remain in the hope that it would unite. Twelve days later he was able to remove the supports of the replanted tooth. But a small pustule formed over the seat of the fracture which disappeared on the application of caustic. The subsequent history was, a recurring pustule at intervals of 3 to 8 months, and during the last two years suppuration appearing at the gum margin which loosened the tooth. In March 1890, the patient in the mean time having got married, her child bumped against the tooth with its head; this started an intense inflammation with copious discharge of pus. She again visited Weil, who

moved the tooth with his fingers. A hard body could still be felt in socket which proved to be the end of root. Absorption had started at the point of fracture of the alveolus and had completely divided the root.

In the same Journal GILLES, of Cologne, describes his mask for the administration of Bromide of Ethyl. This is a modification of the well-known one made of a framework of wire, stretched over with flannel. Two similar frames are used, the one moving on the other by a hinge below, but the two flannels not touching at any point. The object of the second is to lessen the waste of Ethyl Bromide caused by evaporation. In over 150 cases Gilles found that usually anæsthesia was produced by 3 to 6 grains, and anæsthesia set in in 15 to 20 seconds. Only exceptionally was it necessary to open the mask and apply further Bromide of Ethyl to the inner mask. In his cases he has had no evil results, vomiting only occurred in four instances, the patients usually awake at once completely recovered. Gilles adopts the following rules in its administration. He never gives more than 10 grains, (using the above inhaler), if this does not suffice to produce anæsthesia or if there is much excitement he abandons the attempt and does not use the drug again. Be sure the preparation is pure. Take every precaution and pay every attention as when administering other anæsthetics. He does not administer it to women during their periods. Quoting Mittenzweiz he gives the following clinical history of the two fatal cases that have occurred, the purity and quantity of the drug used is not known. "The anæsthesia was not deep, the patients woke without difficulty. They would go home, but feeling weak and ill went to bed. Consciousness and memory were not affected: the breathing was laboured, nausea present and pain in the right hypochondrium. The patients tried several times to stand up, but vertigo and weakness obliged them to return to bed. Respirations quickened to 40 per minute, the pulse to 110 and was small and hard. In the end unconsciousness and stertor set in and followed by death apparently from cardiac failure." Post-mortem results, nil. The deferred action of the drug is noteworthy, showing that it is not eliminated as rapidly as was thought, Gilles has noted that its odour or that of its decomposition products is always present in the breath of the patient on the following day.

F. STARCKE, of Leipsig describes his method of preparing plaster casts to adapt them to the Bonwill Articulator, and

HANS ALBRECHT, of Lubeck narrates a few cases he has met with in practice. One is that of an ulcer of the nipple produced by the already erupted lower cent. incisors of a newly born child. The right tooth broke away soon after the birth of the child. Mindful of Dr. Busch's instructions, "To leave the tooth alone as, else, hæmorrhage may be easily induced," Albrecht hesitated to extract the tooth, but eventually he did so, no troublesome bleeding occurred but with excellent results as regards the health of the child, who, previously, had been restless, refusing its food.

In the *Zahntechnische Reform* No. 18. Vol 10. SCHUMANN SERAJEWO calls attention to the increase in the price of teeth consequent on the increase in the value of the price of Platinum. He is of opinion that this metal will continue to increase in price, causing the present cost of teeth, to be double if not treble. Since diatoric teeth have not the same universal adaptibility as pin teeth, the only way to avoid this increase in price is to use some other metal for the pins.

In No. 19 of the same Journal two curious instances are given of the way in which the teeth may lead to the detection of criminals. The first is rather a curious case. A woman, who represented herself as the wife of a Dental Mechanic in Potsdam, managed to obtain from a Sergeant the price of an artificial denture, by this misrepresentation and by saying that this dentist would be glad to have this denture (which had been ordered by a Lieutenant) paid for in advance. The woman managed to elude detection, until one day this Sergeant's wife visited the weekly market. At one of the stalls she noticed an elegantly attired lady purchasing goods and endeavouring to persuade the man to send them home to a certain address. The Sergeant's wife immediately recognized this lady as the woman who had tricked her husband and this by reason of the thief having only one tooth, which had struck her as rather peculiar in the wife of a Dentist. To cut a long story short, the "lady" is now safely under lock and key. The second case, is one in which a woman had murdered a boy 14 years of age. The body was found to be

covered with wounds and in one place had been bitten. The damning evidence was the fact that the bite exactly corresponded with the teeth of the accused, especially marked was the impression of a characteristic gap in the dental arch.

The *Journal für Zahnheilkunde* for Dec. 25th, and for January 10th, contains as its chief article a translation of Mr. Howard Mummary's paper on "The Agency of Micro-organisms in Caries" which appeared in our issues of October 15th. and November 1st. We note, however, the record of a "laryngeal curiosity." A middle aged woman, had all the symptoms of Carcinomatous or Tubercular disease of the larynx, she was wasted and in spite of well-developed bones only weighed 90 pounds. The medical man, to whom she went, submitted her to a laryngoscopic examination, and was much surprised to find an artificial denture hidden away inside the Larynx. One night, twenty-two months previously, the patient had a violent attack of vomiting, she had, at the time, missed her artificial teeth, but had taken it for granted that they must have been ejected during the act. Since that day she had suffered pain both during respiratory acts, and during swallowing. The denture was removed with difficulty and the woman recovered.

BLEACHING TEETH.

By A. W. HARLAN, M.D., D.D.S.

ONE method of bleaching teeth which has not received the attention it deserves is the following : Method No. 1. The root having previously been filled, all decay is removed from the cavity, and it is thoroughly washed with aqua calcis. A freshly prepared solution of chloride of lime is placed in the tooth and this is in turn gently touched here and there with a dilute solution of sulphuric acid, less than three per cent. of acidum sulphuricum dilutum. This will liberate the chlorine, which will bleach the exposed discoloured dentine. Rewash the cavity with lime water and repeat the process as before,

when it will generally be found that the tooth is satisfactorily bleached. The theory of this process is that the colouring matter is so altered as to become soluble in the alkaline lime water and the bleaching is complete. Carbonic or tartaric acids may be substituted for sulphuric by this process.

Method No. 2. The cavity in the tooth having been freed of grease, serum, and decay, is washed in a dilute solution of soda. Freshly dried aluminum chloride is placed in the cavity and Labarraque's solution of chlorinated soda is introduced on cotton with a pair of platinum, wooden or gold tweezers. The chlorine is liberated and the colouring matters are thereby rendered soluble in a solution of carbonate of soda, which may be used to wash the cavity.

Method No. 3. Wash the cavity with a solution of biborate of soda, introduce dried aluminum chloride and add freshly prepared, or at least a freshly opened, quantity of hydrogen peroxide. In a short time, three or four minutes, the bleaching will be effected by the decomposition of the $\text{Al}_2 \text{Cl}_6$ in the tooth and the colouring matter having been rendered soluble in solution of carbonate of soda, may be washed out and this process is complete. Method No. 4. After cleansing the cavity and removing all visible decay, wash it well with a solution of barium hydrate, then place powdered alum in the cavity and add a solution of chlorinated soda, which will completely decompose the alum and, after the bleaching is effected the cavity must be thoroughly washed with a solution of sodium carbonate and dried.

Method No. 5. [There are a number of processes of bleaching not here mentioned which may be found in current journalistic literature, to which the reader is referred. The reaction of the different processes might have been written out but it was thought to be unnecessary for the purpose of this paper]. A freshly prepared solution of sodium hypophosphite is introduced into the tooth and a jet of carbonic acid is directed on it for a few minutes when the tooth will be found to have attained its original colour. The cavity must then be washed with an alkaline solution and dried. It would not be profitable to further dilate on this interesting subject, but you will permit me to offer the following suggestions: 1. The root must be filled before the bleaching process is begun. 2. The rubber dam must be used. 3. Ordinary hydrant water, rain water or even distilled

water must be kept out of the tooth. 4. Steel or iron instruments must not be used. 5. After the bleaching is done oxychloride of zinc of the proper colour should be introduced at once. 6. When this is well hardened the gold filling must be made immediately. 7. If the labial wall of a tooth has only the enamel remaining, the interior of the cavity must be varnished with copal-ether varnish, with a bleached brush and pure white glazed paper at the suitable size is carefully packed against the labial wall. The paper must not be creased or folded. The above and other precautions are to be observed in the bleaching of teeth in order to secure a satisfactory result.

(*Dental Review.*)

REMOTE RESULTS OF SYPHILIS.

Dr. B. Tarnowsky (*Der Kindararzt* October, 1890) gives, according to his experience, very gloomy evidence as to the results of syphilis on succeeding generations. He makes out that 71 per cent. of women suffering from syphilis either give birth to dead children or bear children who die within a year. He records the terrible history of three families where the fathers had contracted syphilis six, five, and four years respectively before marriage. All these men appeared to be cured when they married, and all their children were born healthy ; yet of these 22 children only 1 grew up to be a healthy man ; 5 were premature, 3 died of meningitis before attaining their second year, 2 were imbecile, 1 an idiot, 1 a cretin, 1 had numerous signs of degeneration, 1 was weak in intellect, 1 sexual perversion, 2 hysteria, 1 epilepsy, 1 was born deaf, 2 had hydrocephalus. Of the 13 still alive when these statistics were taken, 8 were incapable of working for their living, the remaining 5 being sickly and nervous. All three families were of the respectable commercial class ; none of the children were exposed to the hardships which in the case of peasants and artisans may cause infantile diseases falsely attributed to syphilis. Dr. Tarnowsky has collected other histories scarcely less dreadful. He concludes that syphilis in a parent may be the cause of a long series of the most serious diseases—scrofula, rickets, nerve disorders, etc.—and

the offspring at the best are often weak, useless members of society. Carlblom, of Riga (*ibid.*) gives the history of a healthy couple who married. Their first child was healthy and long remained so. *The second, born healthy, died of trismus at the end of a week. The third, born sickly, died of tetanus within a week. The couple were then medically examined. No trace of disease was found on the mother, but extensive mucous tubercles were discovered around the anus in the father. The couple were sent to Aix-la-Chapelle. The mother was treated mercurially during a subsequent pregnancy. She bore a healthy child, who remains in good health. Then the firstborn child, previously healthy, developed symptoms of hereditary syphilis, which were speedily cured by mercurial friction.

British Medical.

A NEW COCAINE TEST.

Pharmacist Schell, of Mulhouse, has called attention to a new reaction which he has observed. When a minute quantity of cocaine hydrochlorate is rubbed with an equally small proportion of calomel, by means of a dry glass rod, on a dry porcelain surface, the mixture will immediately turn black when operator merely breathes upon it. The same change of colour may be obtained by using a glass rod dipped in water, most of the liquid being briskly shaken off. It is necessary the amount of moisture be small, as a whole drop of water is sufficient to prevent the reaction. Taken in all, the breathing process is preferable. No other alkaloid will give the same reaction under similar conditions: pure atrophine alone will blacken calomel when boiled with it in water. It should be remarked that atrophine salts will not affect calomel, while the reverse happens with cocaine, the reaction being afforded by the salts alone and not by the pure alkaloid. Professor Fluckiger, some time since, mentioned several points of resemblance between atropine and cocaine.

Chemist and Druggist.

DENTAL LAW IN ITALY.

Sirs,—I notice in your issue of Dec. 20th a comment upon the dental law of Italy, in which you express approval of the fact that in future a degree in medicine and surgery must be taken by those who wish to practise dental surgery in Italy. Will you allow me to express my entire accord with you up to a certain point? I would certainly advise every dentist whose means, whose time, and whose capabilities will allow him, to take the highest degrees in medicine and surgery, as well as his dental diploma, but I do most strongly protest against the medical and surgical degree being made compulsory. I think it is quite possible to formulate a dental curriculum which shall run *pari passu*, with a medical and surgical curriculum up to a certain point, so that all the general medical education is practically the same for both diplomas, but, in the place of certain medical subjects, dental subjects are substituted. We have aimed at this desideratum in recent alterations in the curriculum for the licence in Dental Surgery at the College of Surgeons, and I am bound to say that this scheme, when carried out in its entirety, and with efficient education and examination, will provide the public, in the future as it has done in the past, with a body of reputable and skilful practitioners in dental surgery.

In conclusion, I would only add that the present curriculum offers every inducement to students to take the double qualification, whilst at the same time it gives them ample time to procure that manual dexterity which two years' constant practice is none too little to secure, even at the cost of giving up certain branches of medical education, not so essential to a dentist as to a doctor.—I am, Sirs, yours faithfully,

S. JOHN HUTCHINSON.

To the *Lancet*.

It is stated that a very valuable mine of Platinum has been discovered in the Colonies and yields the largest per centage per ton, of this precious metal ever known.

Reports of Societies.

STUDENTS' SOCIETY OF THE NATIONAL DENTAL HOSPITAL.

The Annual General Meeting of this Society was held on Friday, January 9th, 1891, at 8 o'clock. P. W. GREETHAM Esq. *President*, in the chair.

The previous minutes of 1890, were read and confirmed.

The *Treasurer*, (Mr. Prager) presented his report and read the balance sheet for the year. It was proposed and seconded by Messrs. Humby and Rushton, that the accounts be audited by the next Ordinary Monthly Meeting. Auditors to be Messrs. R. S. N. Faro, and G. M. Keevil.

The Officers for the ensuing year were then elected, they were as follows :—

President.—R. Denison Pedley, Esq. F.R.C.S

Vice-Presidents.—P. W. Greetham, Esq., Sidney Spokes, Esq.

Council.

Past Students.—Messrs. Faro, Cutts, & E. G. Carter.

Present Students.—Messrs. Prager, Mc. Farlane, and Hemstead.

Hon. Treasurer and Secretary to Council.—Reginald E. Bascombe, Esq.

Hon. Secretary to Society.—H. Burberry Rowe, Esq.

Hon. Librarian and Curator.—Horace Johnson, Esq.

Mr. Humby then proposed a vote of thanks to the retiring officers, Mr. Rushton seconded this, and it was carried most unanimously. Messrs. Greetham, and Arnold Prager, replied.

The *President* then delivered his valedictory address, which was received with much interest. It dealt chiefly with the papers and transactions of the previous year (vide valedictory address).

After a vote of thanks had been passed, the Annual Meeting adjourned until January 8th, 1891. The next Ordinary Monthly Meeting will take place on Friday, Feb. 6th, when Mr. R. Denison Pedley, will deliver his Inaugural Address.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Ordinary Monthly Meeting. held December 1st, 1890. Mr. Felix Weiss, L.D.S., *President*, in the chair.

The Minutes of the preceeding meeting having been read and confirmed,

Mr. Robert Wynne Rouw, L.R.C.P., M.R.C.S., L.D.S. Eng., signed the Obligation Book and was admitted a Member of the Society by the President.

Messrs. Theodore William Harris, L.D.S. Eng., 10, Cavendish Place, W.; Henry L. Albert, M.R.C.S., L.D.S. Eng., Sloane Street, Chelsea; Arthur Wyndowe Willert Baker, M.D.Dub., F.R.C.S.I., L.D.S.I., 18, Lower Fitzwilliam Street, Dublin; were nominated for Membership.

Mr. William John Fisk, 181, High Street, Kilburn, was balloted for and elected resident Member.

The Curator (Mr. Storer Bennett) reported that Mr. Philips (a former Vice-President of the Dental Hospital) had presented to the Museum three ancient instruments, viz., an old pair of forceps, an old elevator, and a double action key without a handle.

Mr. Truman narrated "a case of eruption of a canine tooth under the chin." The patient was a little girl aged six, and a left lower permanent canine erupted below the chin. The history of the case was, that three or four years ago she had diphtheria very badly. When she was convalescent, about a fortnight after, the lower jaw began to swell uniformly and an abscess formed discharging a good deal of pus. Soon after two teeth were extracted liberating a quantity of pus, and a sequestrum separated, when matters seemed to quiet down. Subsequently, however, four pustules appeared on the chin; these burst, leaving sinuses from which necrosed bone came away. Three of these healed, while from the fourth, eighteen months later the left lower permanent canine appeared.

Referring to similar cases recorded, Mr. Truman mentioned a specimen of a lower wisdom now in the Society's museum; also a case given in Mr. Salter's book, viz., both superior lateral incisors appearing in the nostrils. There was also a skull in the museum of the Royal College of Surgeons which showed the eruption of an upper right canine tooth into the

nostril. Mr. Matheson had told him of two cases, one, that of Dr. Ward Cousins. In this a temporary left canine had become encysted in the left orbit, and so far as Mr. Truman could understand, the tumour was removed. In another case under the care of Mr. Carver, of Cambridge, a boy, six and a half years old, had a canine coming the right lower eye-lid, This tooth had commenced to erupt at four and a half.

Mr. STORER BENNET said that it would be recollected that during the year of the presidency of Mr. Charters White a number of skulls and jaws of prehistoric man taken from a Wiltshire barrow, were shown. One of them was the lower jaw of a child, in which there was a partially developed lower canine tooth inverted ; this had not pierced the jaw ; the crown and a small portion of the root had been developed, and the crown pointed downwards.

Mr. MORTON SMALE said three or four years ago a case had occurred at the Westminster Hospital of a permanent canine erupting into the nostril. The patient's age was seventeen or eighteen. The tooth was removed through the nostril. The important thing was to account for the tooth becoming inverted and presenting itself in this position. So far Mr. Smale had not yet met with anyone who could satisfactorily explain it.

Mr. F. NEWLAND-PEDLEY mentioned having removed a canine tooth through the nostril. In that case the patient had a harelip.

Mr. WM. HERN stated that a little patient, the subject of harelip and cleft palate, was now attending the Dental Hospital. He had seen the patient on several occasions, and about six months ago removed a supernumerary tooth from the nostril. The case was similar to that mentioned by Mr. Newland-Pedley.

THE PRESIDENT remarked that many years ago a lady came to him wearing an artificial denture which she had worn for years. Underneath the lower plate he found two canine teeth lying horizontally on the gum. They were perfectly formed and perfectly clean.

Mr. F. J. COLYER showed the model of a case in which the canine had erupted underneath the tongue. The patient a female, aged thirty-five gave no history and suffered no inconvenience.

Mr. WM. HERN said that he had a model of a case of a misplaced canine. The patient was a young woman who

applied at the Middlesex Hospital, complaining of the looseness of the left upper lateral incisor. Necrosis was found to exist, and after removing the tooth and a small portion of the anterior wall of the socket, he came upon a white hard body imbedded almost horizontally in the jaw in an oblique direction. There was also a history of previous necrosis following diphtheria. So it seemed to Mr. Hern that necrosis might have been the cause of the inversion.

Mr. H. WOODRUFF mentioned two cases in his own practice which occurred almost simultaneously. One, a canine occupying a horizontal position on the outer portion of the arch and above the roots of the other teeth, and the other growing quite up in the palate and also in a horizontal position. In both these cases the patients were between seventy and eighty, and the abnormality had given no pain up to that time. But at the time of consulting him they began to give considerable trouble, and he was fortunately able to remove both.

Mr. J. O. BUTCHER showed a new holder for the handpiece of the dental engine, made of a piece of stout wire bent roughly in the form of a corkscrew spiral, which allows the cable to drop into it freely and to be easily removed when wanted. It is more effectual than the clip usually sold with the engine, and has not the disadvantage of the clip, which becomes weak and almost useless after some time. He had used it for about two years, and had found it much more convenient and handy than the clip.

Mr. J. Ackery commended the device.

Mr. MORTON SMALE showed two obturators designed by Dr. Brandt of Berlin; one for use in cases of unsatisfactory staphylorrhaphy. The principle was that of a small india-rubber bag, attached to the artificial palate, which is put into the mouth in a flaccid condition and then inflated.

THE PRESIDENT remarked that their great advantage was that they were not likely to create irritation. He should doubt their durability.

Mr. MORTON SMALE said they were so cheap that their durability was of no importance.

Dr. RICHARDSON was then called upon to read his paper.
[See page 97.]

DISCUSSION.

Mr. THOMAS ARNOLD ROGERS referred to the fact that he had on some occasions availed himself of Dr. Richardson's skill, and had done so with great advantage. He never extracted a tooth for any of the members of one family of hæmorrhagic tendency without first ascertaining that Dr. Richardson was in town.

The PRESIDENT remarked that he was surprised that Dr. Richardson had not mentioned, as a means of checking bleeding from the sockets of teeth, the replacing of the extracted tooth or teeth. He had also found dilute nitric acid to act as an excellent hæmostatic. In a case which he cited it had staunched bleeding which had persisted for thirty-six hours. The patient, it might be interesting to state, died ultimately from hæmorrhage from a wound in the mouth.

Mr. F. NEWLAND-PEDLEY said in pronounced cases of hæmophilia the treatment he learned to was to take the patient into a hospital, and give perchloride of iron with Epsom salts internally for a week. By this means he was under observation, and had no access to alcohol.

Mr. W. H. COFFIN presumed that Mr. Newland-Pedley's observations were intended to enforce the importance of treating these patients at their own homes.

Mr. STORER BENNETT remarked that from time to time there were unfortunate cases, in which elastic bands having escaped observation, the periosteum had become separated. The occasional use of such a band was one that might be adopted with great advantage for the purpose of loosening the teeth of bleeders. About four years ago they had in the hospital a young man of distinctly hæmorrhagic tendency with a tooth requiring removal. It was decided that the best way was to put a band round the tooth and change it from day to day, forcing it further and further up the tooth, which was by this means removed. He had found that peroxide of hydrogen was a useful hæmostatic. From time to time it was necessary to inject it up sinuses, and if in inserting a probe slight hæmorrhage was caused the instant the peroxide was introduced, bubbles were given off and the hæmorrhage stopped. Having noticed this, he had used a 20 per cent. solution for arresting hæmorrhage, with

the result that the blood was staunched immediately. About six months ago, however, when resorting to the same remedy it did not act as a hæmostatic. But, although it did not always effect the purpose, it was nevertheless very useful, and it was desirable, if possible, to have three or four strings to one's bow.

Mr. R. H. WOODHOUSE felt sure that it would not be the wish of the Society to narrow down the discussion to the question of the means of arresting hæmorrhage. Dr. Richardson had mentioned the disappearance of scurvy, which was very prevalent forty or fifty years ago. Mr. Woodhouse was inclined to attribute the disappearance in a great measure to the co-incidental increase in fruit importation, which was so great that oranges and lemons, which formerly had a very limited season, could at the present time be purchased almost all the year round. He had himself seen one or two cases of aggravated scurvy successfully treated by a judicious and liberal system of diet, one case was that of a young midshipman on board ship, whose face and body were covered with patches, the teeth also being much affected and the gums swollen. Nearly every dental surgeon had his favourite method of arresting hæmorrhage. He used cotton wool steeped in styptic colloid, but not quite in the same way as Dr. Richardson ; if it were pressed too forcibly into a cavity it was apt to give considerable pain ; he used it with an anodyne, and believed carbolic acid to be the best. He considered that a great deal of the trouble which arose in endeavouring to arrest hæmorrhage was due to pressure ; he found very light pressure sufficient. The socket of each fang should be carefully filled with the saturated wool, not with one general plug, but built up of small pieces, after the manner of a gold filling. All plugs of wool should be removed after a few hours, otherwise considerable inflammation followed and became a cause of subsequent bleeding. Mr. Woodhouse then described a method of uniting ligatures from adjoining teeth over and crossing the plug or compress placed over the sockets from which the hæmorrhage was taking place. He further mentioned the simple method of retaining a plug by a soft wood strut wedged between adjoining teeth.

(To be continued.)

Review.

A treatise on the Irregularities of the Teeth and their correction. By John Nestling Farrar M. D., D.D.S., published in three volumes, by the International News Company. Illustrated with nearly 2,000 engravings.

We have received the first volume of this work, and a very sumptuous volume it is, in half binding, well printed on excellent paper, and well illustrated. The part of the subject treated of in this volume is divided up into fourteen parts, under the following headings :

1. Preliminary.
2. History.
3. Etiology of Irregularities.
4. Philosophy of the Author's System.
5. Nomenclature.
6. Principles in Construction of Regulating apparatus.
7. Retaining Devices.
8. Laboratory Rules for making Regulating Devices.
9. Philosophy of the Application of Force.
10. Eruption of Teeth.
11. Antagonism of Teeth.
12. Correction of Teeth by grinding.
13. Interdental Spaces.
14. Extraction of teeth for prevention and correction of irregularities.

We may pass over the preliminary chapter and those dealing with the history, with the remarks, that the former is a more or less digressive account of the intents and scope of the work, and the latter gives an interesting sketch of dentistry beginning, according to the figures given, about 3,100 B. C. The first mention of Correcting Irregularities known, is stated to occur in a little book by Egenolff published in 1541, this, however, only refers to the evil effects of undue retention of the temporary teeth. From this point onwards, the historical narrative deals more exclusively with irregularities and their treatment.

The section on Etiology, after some chapters of an

anatomical nature, deals with the subject in a comprehensive manner. There is little or nothing that is new, but facts, and opinions are brought together and blended into an interesting narrative, although sometimes the digressions serve rather to carry one away from the argument. The part treating on the "Philosophy of the author's system" will, of course, be regarded with great interest. Dr. Farrar takes the view that all regnating forces should be intermittent in their action, the limit of force allowable at any time should be short of that which causes pain, this, while it cannot be stated dogmatically he believes to be about $\frac{1}{120}$ in. daily. The author treats the question in a liberal spirit and is perfectly willing to admit that there may be many exceptions to his rule. There are of course minor points the logic of which one does not quite agree with, for instance, speaking of why a permanent tooth, erupted in the wrong place by reason of the delayed "shedding" of its deciduous predecessor, tends to gain its normal position when the temporary tooth is extracted, Dr. Farrar assigns it to two reasons. 1st Inherent tendency. 2nd Elastic reaction of the alveolus after being cramped "by the overpowering force of the tooth in the process of eruption." The first is no reason, but simply a term by which we express a fact we know occurs but how we do *not* know. The second we cannot believe, if the pressure of an erupting tooth caused anything it would be absorption, not compression of the alveolus and we see the same travelling forwards of a second molar, after extraction of the first, when there can be no "cramped" alveolus to expand. Space will not allow us to treat the other sections of this valuable work in detail, but they certainly merit the attentive study of all students of the Profession. We are sure that the practitioner will find many designs and ideas which will stand him in good stead. The next volume will treat of the correction of the teeth by mechanical devices whilst the third will consist of illustrations, duplicates of those already given in the earlier volumes with additions, they will be classified under the headings. 1. Inclined planes, 2. Wedges, 3. Elastics, 4. Levered Ferules, 5. Springs, 6. Screws. A reference index will be given. We await these volumes with considerable interest and congratulate Dr. Farrar on that portion of his "labour of love" which now lies before us.

Dental News.

APPOINTMENTS.

Mr. H. J. Thomas, L.D.S.I. has been appointed Honorary Surgeon Dentist, to the Swansea Hospital, *vice*, Mr. F. Clanston Scott, L.D.S. Eng, deceased.

DENTAL HOSPITAL OF LONDON, the following gentlemen have been elected Assistant Dental Surgeons. Messrs. F. J. Bennett, M.R.C.S., L.D.S.; J. T. Colyer, M.R.C.S., L.R.C.P. L.D.S., C. F. Rilot, M.R.C.S., L.R.C.P., L.D.S., A. C. Woodhouse, M.R.C.S., L.D.S., & W. H. Woodruff, L.D.S. We understand there were sixteen candidates.

ANSWER TO CORRESPONDENT.

C. E. ATTWATER.—As far as we can gather by your letter you did not commence the practice of dentistry till *after* 1878 and therefore you come within the act of that year. You would not, therefore, obtain a diploma in England without passing a preliminary examination and going through a two years hospital curriculum besides the period of mechanical work, for the details of which we must refer you to our September 15th issue. You would, of course, spend a period of study at one of the Dental Hospitals, during your visit to England and no doubt the Deans would meet you in the question of arrangements.

To Correspondents.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Offices 289 & 291, Regent Street, London, W., by the 8th and 23rd of the month, and must be duly authenticated by the name and address of the writer.
2. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
3. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only; and we also beg to call particular attention to the importance of a carefully-penned signature and address.
4. All communications relative to subscriptions and advertisements are to be addressed to the Publishers, Messrs. J. P. Segg & Co., 289 & 291, Regent Street, London, W.
5. The Journal will be supplied direct from the office on PREPAYMENT of subscriptions as under:

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ON THE CAUSES OF HÆMORRHAGE AFTER TOOTH EXTRACTION AND THE IMMEDIATE TREATMENT.

BY BENJAMIN WARD RICHARDSON, M.D., F.R.S.

(Continued from page 105.)

VASCULAR HÆMORRHAGE—HÆMORRHAGE FROM DEFICIENT CONTRACTILE POWER OF BLOOD VESSEL.

What I call vascular hæmorrhage is a form of hæmorrhage after extraction of the teeth in which the fault lies in a primary want of contractile power of the blood vessel—artery—divided during the operation. In perfectly healthy states of the body, in addition to the process of solidification of blood, the obstruction from the contraction or shrinking of the divided vessel is a powerful agency in arresting hæmorrhage. Moreover, the act of removing a tooth is favourable, because the vessel is not cut clearly across, but is torn, by which the contraction of the coats of the vessel is greatly increased. At the present time our surgeons are practising a mode of arresting hæmorrhage, even from very large arteries, by what is called the torsion method, and which consists, in fact, of seizing the artery with a pair of strong forceps, pulling it gently forward, and twisting it firmly. This same process the dentist carries out unintentionally to a considerable extent whenever he extracts a tooth, and there can be little doubt that the rarity of severe flux of blood after operations on the teeth is partly accounted for by this circumstance.

There exists, notwithstanding, a distinct class of cases in which there is copious hæmorrhage, owing to absence of true contractile power of the arterial tube, and there are constitutional conditions leading to this particular state of vessel. The

vessel is torn across and does not contract, whereupon the blood continues to flow with sufficient freedom to wash away any clot that may be formed and give rise to copious hæmorrhage.

There are three or four classes of persons who suffer from hæmorrhage of this character on slight causes. In the largest class a slight physical accident on the body is apt to produce a discoloured spot or bruise with swelling, and after a time firmness of structure at the point of the swelling. These subjects are usually well nourished and young. They are disposed to be fat, and if they are carefully inspected while undressed they are found to possess some deformity of body more or less marked. The spine will show a slight curvature, or a lower limb will be a little distorted, or the chest will be badly developed or misshapen. The blood may, however, be perfectly natural, and there may be no hereditary hæmorrhagic diathesis. If a little blood be drawn for examination, it is found to coagulate quickly and firmly. The colour of the blood is natural, and the corpuscles are of normal size and outline. There is, in fact, no definable disease of the blood.

In other examples of this type of hæmorrhage, the patients are what is called anæmic or bloodless, and it has been customary to look upon these as persons in whom the blood is unusually fluid. This is not strictly the fact. Such persons, it is true, bleed readily from slight causes, but not because their blood is necessarily deficient in power of coagulation. The clot formed by their blood may be loose and yield a large exudation of water, but it coagulates in sufficient degree to play an important part in checking the flow.

In a third class of vascular hæmorrhage the effect of alcohol plays the leading part. The subjects here are free partakers of the subtle poison. They are generally in the middle period of life, and present all the evidences of alcoholic constitutional change—the vascular cheek, the excitable, feeble heart, and nervous uncertainty.

A fourth class coming under this order are victims of syphilitic disease, the influence of which on the structure of blood vessels is so marked that at Netley Hospital there exists a whole series of specimens of arterial degeneration from this cause.

In all these varieties the blood may retain its power of coagulation and in all of them the free hæmorrhage is traceable to vascular deficiency. Either the minute vessels are paralysed, or there is some degeneration of structure in them so

that they permit the blood to flow through them under slight mechanical injury, innervation or degeneration.

In summary, the subject of vascular hæmorrhage are persons of enfeebled constitutional and nervous type, showing relaxed circulation in sudden blushing and suffusion of the face, with other signs of relaxed peripheral circulation; or, they are anæmic, or alcoholic, or victims of specific degeneration.

It has befallen me to have illustrations of all these types of hæmorrhage. In two cases of anæmia the symptoms were extreme, although recovery took place. In one instance of alcoholic form the patient, a lady, was brought from the dentist's chair to my house in a carriage and was treated with the utmost difficulty, owing not so much to a loss of blood as to her own restless fears and rambling resistance to everything that was being done for her. In one of the examples of specific disease such was the degeneration of the upper maxillary bone and palate, as well as of the blood vessels, that *in extremis* while the patient was in syncope I cut away with a fine saw the whole of the hard palate, and so reaching the anterior palatine artery which was yielding the blood, stopped the effusion by torsion and so controlled the hæmorrhage that the patient ultimately recovered and is still alive, twenty four years after the event described.

In both these cases I was aided by the circumstance that blood coagulated, and I dwell on them in order to draw the distinction between purpuric hæmorrhage and vascular.

MECHANICAL HÆMORRHAGE.

It remains for me only to mention under the heading of cause the last-named division—hæmorrhage from mechanical lesions favouring the flow of blood. These are lesions due to accident connected with the extraction, fracture of alveolus or tearing away a portion of alveolus. I have once or twice known this accident, but in my experience it is extremely rare as a cause of hæmorrhage, and as the treatment is the same as for vascular hæmorrhage I need not dwell upon it more than to say that in the worst example I have seen the tooth was so firmly adherent to its socket that nothing but removal of a portion of alveolus could have secured the extraction. The hæmorrhage was profuse but controllable, and no serious injury resulted.

THE QUESTION OF TREATMENT.

We come now to the all-important question of the immediate treatment of the cases under consideration. It is unnecessary for me to trouble you with any thoughts or suggestions as to ultimate or constitutional treatment. It will be most profitable to consider how best at the moment the dentist can stop the flow of blood and let his patient depart from his care quite secure. It will be inferred that in the cases already commented on, various remedies have been adopted, and I am sure that I must have seen twenty or more tried with more or less of success. My desire is to name the simplest and the best in the short time still at my disposal. In my early practice, on being summoned to a case, my instant attempt was to stem the flow of blood, without enquiring too minutely what was the cause of the accident. By and by I found that there was rarely any great reason for hurry; that it would take a long time for a person to die from the loss of blood, and that faintness was not such an anxiety as some make of it, but rather assisted the action of remedies, because it relieved the tension of the circulation, and made it easier to manipulate on the point from which the hæmorrhage proceeded. Gradually I found certain reliable steps, which I now follow, and which I think should always be followed.

In the first place, it is essential to ascertain if the blood that is being lost is or is not coagulable. If the blood is coagulable, if a little of it caught in a cup or glass goes into a firm clot in the course of two or three minutes, much cause for alarm is removed, and the line of treatment is sufficiently clear. We may be sure in such a case that the cause is either vascular or mechanical, that there is failure in the contraction of the bleeding vessels, or adhesion of the vessel to the surrounding bone tissue, or rupture of an abnormally large vessel. Whichever it may be there is the assurance at hand that the blood is in a favourable condition for forming a plug, and that if it can be retained in the cavity a sufficient time to enable it to form a firm clot it will produce a natural arrest. I shall deal with this simple treatment first.

Treatment of Vascular and Mechanical Hæmorrhage.

This treatment includes three methods. (1) The styptic. (2) The plug with pressure, with or without styptic. (3)

The cautery. In the beginning of my practice I trusted mainly to styptics in this class of case, and after many trials I came to the conclusion that nitric acid was the best. I believe still, that as a styptic it is the best, but it has the disadvantage of being very difficult to manipulate with, owing to its extreme caustic and destructive properties. I afterwards invented styptic colloid, which is composed of tannin in collodion, with addition of tincture of benzoin; and for ordinary cases I do not know of a better. The colloid can be applied on cotton wool and a firm plug of it can be inserted with much facility. When this did not seem sufficient I resorted to perchloride of iron applied in solution with cotton wool. It has often happened that these simple methods have proved effective, when they have not, I have proceeded to the second plan, that of the plug with pressure.

Three kinds of plugs have been used. One it made of soft, well-teased cotton wool saturated with styptic colloid. The mass is not put in in too moist a form, but mixed in a cup is allowed slightly to dry by the evaporation of the ether. Then, after well drying the bleeding cavity with a pledget of lint, the colloid cotton is inserted with forceps, the point of which has been dipped in olive oil, layer by layer, as in a process of roughly stopping a tooth, until the cavity is completely filled. A little bit of dry wool is next made to cap the whole, and pressure is made with the finger or with Harding's compress until the plug is solid, which, owing to the escape of ether, is rather a quick process.

A second plan is to use a perchloride of iron plug made by saturating cotton wool with solution of perchloride of iron, and then drying the cotton down. Cotton so prepared can be kept in bottles ready for use, and can be applied as a plug in a similar manner as the colloid. I have also constructed what may be called the *wick styptic*, and this is very useful in minor cases. It consists of a glass tube having a narrow point, through which is drawn a piece of cotton wick saturated with perchloride. A portion of the wick projecting from the narrow end of the tube can easily be inserted and firmly held in the cavity; when it becomes saturated with blood it can be cut off, a new bit pulled out and a fresh application made.

The best plug of all I have been able to construct is a gutta-percha styptic plug. It is very convenient, and is easily kept at hand for an emergency as a disc. The discs, here named, consist of gutta-percha saturated with a styptic, tannin or

perchloride of iron. One of these discs, picked up by the forceps and held for a short time in hot water, softens and becomes so malleable that it can be inserted into any cavity. The bleeding tooth cavity is quickly dried with absorbent cotton wool, and is then filled with the plastic styptic, pressed firmly down to the bottom and held there until it becomes firm. There is no fear of putting in the plastic styptic too hot, since heat favours coagulation. I have placed a few of these styptic discs before the Society, this being the first time on which I have brought them into notice.

Treatment of Purpuric Hæmorrhage.

The lines of treatment above-named are required for cases of mechanical hæmorrhage, in which the blood is naturally coagulable. I therefore pass at once to consider the management of those more serious accidents in which the blood is deficient in plastic quality. I need not dwell long on this matter, because my mind is made up in regard to treatment. Presuming that the blood flowing from the injured part shows no tendency to clot and is discharged in a steady stream, which is not arrested by pressure or the ordinary application of styptic, it is necessary at once to produce secondary or albuminoid coagulation. It must be remembered that no blood is constituted that it cannot be made to coagulate. In the most fluid blood there is albumen, which will not become solid spontaneously but can be solidified by various means we have at hand, namely, tannin, perchloride of iron, and the subdued actual cautery. It may be well always to try the two first-named styptics, and in the perchloride percha styptic and the percha tannin styptic, to some extent, we have substances which will coagulate albumen, even when they are not heated, and will instantly coagulate albumen, if heated to 140° Fahr. These, therefore, are very ready in emergency. If they fail, no time should be lost in resorting at once to the cautery. When the electric cautery is at hand, it is the most convenient; it does not alarm the patient, and the heat of the terminal probe is sustained in the cavity; but if the electric cautery be not at hand, the next best is the small iron cautery, an iron bulb terminating in a rounded point and fixed in a strong handle at an oblique angle. This bulb and point can be made red-hot in the flame of a spirit lamp or of a gas jet. But it is not necessary to alarm the patient by using it while it is in a state

of glow. It may be allowed to cool down until all redness has disappeared and can then be inserted deep down into the bleeding cavity. Skilfully used it gives no pain of moment and its effect is, as a rule, immediate in the arrest of blood. Should it fail there is no other direct local measure that can be depended upon. Even ligature of the carotid if the case should come into the hands of the surgeon would be a doubtful measure, since hæmorrhage from the surgical wound might be uncontrollable and simply add to the danger. Happily, for my part, the danger has only once pressed to the extent of suggesting so extreme a measure, and then the hæmorrhage was stopped by the cautery and did not return. In other cases, four in number, the cautery has acted at once. It is a remedy applied with unusual readiness if the idea of fear of it be not exaggerated. It should never be used at such a heat as to destroy structure. The coagulating power of heat over albumen, viz. 140° F. is all that is required strictly, but this may be safely exceeded to 150 or 160 degrees.

Before I conclude there are two other topics to which I must call attention. It is customary when the accident of hæmorrhage occurs for the operator, or for some bystander, to administer wine, brandy, or some other alcoholic stimulant to the patient, under the false idea of sustaining the vital power. It is my solemn duty to protest against this practice on the strictest and purest scientific grounds. The action of alcohol, under such circumstances, is injurious all round. It excites the patient and renders him or her nervous or restless. It relaxes the arteries and favours the escape of blood through their divided coats. Entering the circulation in a diluted state, it acts after the manner of a salt in destroying the coagulating quality of the blood; and above all other mischiefs, it increases the action of the heart, stimulating it to throw out more blood through the divided vessels. These are all serious mischiefs, but the last named is the worst. In hæmorrhage the very keystone of success lies so much in quietness of the circulation that actual failure of the heart, up to faintness, is an advantage; it brings the blood at the bleeding point to a standstill, enables it to clot firmly, when it has that tendency, and so to form the most effective possible check upon the flow from the vessels. In the case I spoke of in which I removed the hard palate, the quantity of blood lost during the hæmorrhage amounted to over three pounds

weight, and the syncope was so extreme that the patient did not know that anything had been done to him after he returned to consciousness. But not a drop of any stimulant was administered him at any stage, and the care to avoid any such administration was carefully sustained after recovery, in order that the rapid action of the heart might not overcome the resistance of the tenderly sealed up vessels. Indeed, I am certain that this rule of avoiding stimulation was far more effective in saving my patient's life than any surgical skill of mine, for the vessel I twisted might have become plugged up naturally during the syncope, but nothing would have prevented the bleeding from breaking out afresh if the heart, instead of being allowed to swing round of itself slowly and safely, had been whipped, for a brief period, into violent action. I refer to this case as typical, because if a stimulant was not wanted in it, a stimulant cannot be called for in examples less severe. The course followed in that case was to lay the patient quite recumbent when signs of faintness supervened, and so long as he could swallow to feed him with warm milk and water freely. This, in my opinion, is the proper treatment to be employed in every instance of syncope from loss of blood.

The second concluding topic has relation to the effect of blood swallowed by patients who are bleeding from the mouth. In all bad cases of hæmorrhage from the mouth some blood is almost, of necessity, swallowed. The act sometimes gives cause for undue alarm, and it invariably alarms the patient. At first I was a prey to some alarm on this score, but experience has shown that the anxiety is groundless. The fact of a person swallowing a good many ounces of blood is not necessarily injurious. The blood is digested and is re-assimilated if it be not carried into the stomach in too large a quantity. When it is carried in in too large a quantity it is usually vomited, with a return of faintness, from which, however, I have never observed any serious danger nor recurrence of bleeding if that has been thoroughly staunched.

There are some other points of after-treatment of hæmorrhage, particularly in examples of the purpuric type. But as such treatment is mainly constitutional in character, and calls for internal remedies, it belongs to the physician and need not be insisted on in an essay which relates exclusively to the art of tiding over danger in the operating room and from one particular class of operation.

SUMMARY.

In summary, the leading points I put forward are that hæmorrhage from tooth extraction is due to one of three sets of causes. (1) To purpuric or fluid blood of which there are two varieties; (*a*) the aqueous, (*b*) the saline. (2) The vascular weakness or paresis of artery, occurring in constitutions (*a*) strumous or serofulous, (*b*) anæmic, (*c*) alcoholic, (*d*) syphilitic. (3) To mechanical lesion, the result of extensive mechanical injury.

In the treatment of hæmorrhage of the second and third classes styptic treatment with pressure is that most immediately useful, the best styptics being tannin, and perchloride of iron, either of which may be applied by means of the styptic gutta-percha disc. In the treatment of vascular hæmorrhage secondary or albuminoid coagulation must be induced for which the subdued actual cautery is necessary. In all cases alcoholic stimulation is inadvisable; and the fact of blood being swallowed need not afford cause for anxiety.

VALEDICTORY ADDRESS.*

By FELIX WEISS, L.D.S.

IN assessing the social and the scientific condition of a people no better test can be applied—at the present day, at least—than that furnished by a study of its literature. I can hardly imagine the advancement of any profession without a corresponding advancement in its written records; and it is always a profitable enquiry to mark the progress made in those branches of science that admit of being illustrated by published records.

It is not my intention, in a short valedictory address like the present, to do more than glance at the literature which has enriched our own profession, and we are at once met by the startling fact that our very existence as a scientific body hardly marks more than 100 years. Every medical catalogue sufficiently demonstrates the wonderful changes that distin-

* A paper read at the Odontological Society.

guished the discoveries made in medicine and the improvements in surgery while passing from the seventeenth to the eighteenth century, and more conspicuously the progress that characterised the opening years of the present century. It is not desirable that we should now trace this progress, although the study is a fascinating one. We may observe that it was not until the second half of the eighteenth century any treatise on the teeth meriting record appeared. In 1771 John Hunter's "Natural History of the Teeth," and the same author's work on "Diseases of the Teeth," was given to the profession in 1778; but, strange to say, the century ended without any essay in extension of these researches. A great change now, however, showed itself, and the medical and the dental world seemed suddenly to awake to the importance of our branch of medical science. In dental matters, before the nineteenth century was half exhausted, no less than fifty works were published in the English language alone, and the familiar names of Fox, Bell, Saunders, Nasmyth, Tomes, and others merit our recognition and their labours demand our heartfelt thanks. The second half of this century is so near our own time that it would be invidious to do more than acknowledge the steady progress that has characterised our subsequent efforts. I might, however, be allowed to refer to John Tomes' "System of Dental Surgery," first published in 1856, and my conviction that this work did more to advance the general knowledge of our art than any treatise previously given, and that its subsequent editions in conjunction with his son, Mr. Charles S. Tomes, have conferred a lasting benefit on the present generation.

I must not, however, conclude these hurried remarks without alluding to the periodical literature of this period, and perhaps I may be allowed to refer with pardonable pride to the forty-years of journalistic work I have more or less had something to do with. I remember the first number of the *Forceps* being published, and I must say that with all its faults (and it had many) it led the way to further literary progress, and gave the opportunity for thoughtful men to express their views and to try and advance the status of our profession. It is well known to many that I have always advocated anonymous authorship, and I still hold that reforms of most kinds would never have been effected if the names of the proposers had always appeared. For as Sir Walter Scott had said, "We do that in our zeal our calmer moments would

be afraid to answer." In dental matters the angry discussions of a past period have only made the sunshine of our present advancement the more brilliant, and I can hardly point to a single year when advancement was not effected by those who perhaps—naught suspected—anonynously laboured for the general good.

As a scientific body the Transactions of this Society will ever hold a conspicuous place in our literature, and I venture to believe that its records from 1857 to the present year will contrast favourably with the records of other medical societies, and that our profession has no occasion to be ashamed either of its industry or its progress. That the Transactions of the session which nominally ends this evening have not been behind former years either in interest or importance, I think you will willingly admit; and I see around gentlemen whose training warrants me in believing that the advantages afforded by hospital practice and the improvements which spring from improved modes of procedure in everyday work will continue to enrich our records, and make the Transactions of the Odontological Society even more worthy of our acceptance and better calculated to raise the status of our profession.

For myself, I have but thanks to offer to all those who have so faithfully supported me. Officers and members alike have tried to make these last days of my professional life happy ones, and although my words are but few, believe me they are heartfelt and sincere.

VALEDICTORY ADDRESS.*

By Mr. P. W. GREETHAM.

GENTLEMEN,—We have now completed another year of our life. Twelve months ago we sat listening to the masterly criticism by Mr. S. Spokes on Tomes's last edition of Dental Anatomy; this time we shall not have anything of the sort, but a brief resumé of our work in the past, a few hopes for the future, with a practical point or two in conclusion.

* Delivered before the Students' Society of the National Dental Hospital.

In the first place allow me to thank you again for the honour you conferred on me and for the considerate treatment of my too many mistakes in the chair. I have greatly valued this position, having been a member of the Society since 1877, when it was founded and having filled the post of joint Secretary in 1878-9. In my position as president, I have been brought into closer intimacy with the members, many of whom I have come to know better than I could have done without. I would also thank those members of the staff who have supported me, especially mentioning my old master Mr. Humby, who has not missed being present on any occasion.

We have heard the report that our Treasurer has presented to us, and I think that we can congratulate ourselves that during the present year we have not gone back.

In February, we had to inflict the usual inaugural address ; this year, I think that there is a change in store for you, for the Secretaries have arranged for a rather important paper from an original point of view to take its place, this, by the way, is I think, only what it should be ; for from the nature of an address, it does not lend itself to a discussion, and anything that tends to make these meetings in any way outside the Student should be put down.

In March, we had a paper by Mr. Keevil on Sensitive Dentine, this I may as well say at once, being the only paper read by a present student during the session now ending will receive the Prize, fortunately, though being the only one, it was of a remarkably high standard. It is not in my province to say, but it will most likely also receive the prize most generously given by Dr. B. W. Richardson. I did think when I took office, that with this prize before them, Students would so rush forward with papers that our Secretary would have been obliged to ballot for places, but instead, we get one paper from a student, and the rest from Medical men and past students.

In April, Mr. Fisk was to have read his paper on Cleft Palate, this at the last moment was not forthcoming, so some interesting casuals filled up the evening.

In May, we were honoured with the first of the two papers read by medical men, viz., Dr. Hill's paper on the Interdependence of Rhino-Pharyngeal and Dental Diseases ; this paper was most valuable especially for the admirable lesson on the Tonsils and their functions. In passing I would call attention to an interesting paper, that appeared in the *Review*

of *Reviews* for September on those most interesting little animals so much spoken of by Dr. Hill, I mean Phagocytes.

For the meeting in June, we were promised what at one time was thought likely to lead to a most promising discussion, I refer to the resolution of Messrs. Stocken and Keevil to insert the word male before that of student, in our Bye-laws and so prevent ladies from becoming members of our Society. This resolution somehow or other at the last moment did not take members' fancy, for when the night arrived, not only did the mover absent himself but with the exception of some 3 or 4 all the rest of the members did the same. We have not heard any more of this subject, and I think personally it would have been better if we had not heard of it.

After the vacation, in October, we had the second paper by a Medical man, viz., Dr. Roughton's on the early Diagnosis of Surgical Affections of the Mouth, this paper in my opinion was the most important one read before the Society this year, bringing as it did most prominently those cases where the dentist may do so much good by his knowledge, saving the patient so much suffering, for in many of these trivial beginnings one sees some serious cases arise.

At the November meeting, we had the pleasure of hearing from our old dean Mr. Thomas Gaddes. I am sure that many of the past students, to whom Mr. Gaddes is more than a name must have been very glad to hear once more from him for whom they have such great respect. This reminds me that in February, Mr. Lancaster, an old member of this society, sent us word how they taught dental surgery in Philadelphia.

Mr. Fisk's paper on "Cleft Palate" was read at the November meeting, this paper was so recently before us that it is sufficient to merely mention it.

One great thing that we have done is I think the publication of our Transactions.

Having briefly reviewed our past doings, may I appeal to members to come forward with papers for the coming year, for it cannot be expected that we shall always be honoured by some member of the Medical Profession reading papers before us. Of course, we shall be met with the old excuse, I cannot find a subject, surely, most of you have some hobby that is more or less connected with our profession. Again, there may have been some mechanical difficulty that has been overcome during your pupilage, some case seen in the wards

or in the chair, there may be points in the curriculum that you have fixed opinions upon, and if having one of these think of the benefit one derives from reading a paper before such a Society as this, where the critics are your fellow students or members of the staff only too willing to help. It is by such small beginnings that one is led into putting facts together, working out details in connection with one's subject so that in after life should you be so disposed to join the British Dental Association or Odontological Society, you will have got over the feelings of the novice and be better able to take a stand among your fellows.

In conclusion I should like to bring one or two practical points before you, viz., In the Inlays that Mr. Clark brought before the Society it is absolutely necessary that the firing should be done in the flame of an absolute alcohol lamp, spirit will not do it properly, with regard to the question of alcohol or water for mixing I find that I can manage with water just as well as alcohol.

I also bring before your notice Gear's Shaded Pink. I hand round two specimens just roughly put together so as to show the capabilities of the material, you will notice that the colour gradually merges from a dull white to a deep pink, and when the surface is moistened with saliva gives the case a better look than the pink usually used. I do not think it perfect by any means, but do think it an improvement on the old style or on Gilbert Walker's Corrugated Rubber.

Thanking you for your attention during this address, I trust that the Society may still prosper as it has done in the past.

COMBINATION OF CEMENT WITH AMALGAM.—Mix the Amalgam in the usual manner, avoiding an excess of mercury, whereas the cement is mixed perhaps slightly thinner than usual; the two are then thoroughly incorporated by means of a stiff spatula. The amount of amalgam used is, in bulk, about one-third to one-half that of the cement. The material may also be prepared by simply dropping the amalgam already mixed into the liquid of the phosphate cement and then incorporating enough powder to make a stiff paste. The filling is inserted in the same manner as a simple cement filling.—*Cosmos*.

British Journal of Dental Science.

LONDON, FEB. 16th, 1891.

THE ODONTOLOGICAL SOCIETY.

OF course, we know very well that the Odontological Society is, strictly speaking, a private society belonging to its members. In one sense we have no more right to criticise its proceedings than we have to discuss the management of any private club. Yet surely, looked at from another point of view, the Society occupies a unique position in the dental profession of Great Britain, nay, of the world. It has deserved this position. It has done much for the profession. Born in the old dark days, ere almost the profession was ; when all that was creditable in the practice of dental surgery gathered around a comparative few ; it has grown with the profession and helped to make the profession. It is on this ground that we feel entitled to discuss its proceedings, in no unfriendly spirit, but actuated by the same desires for its advancement and prosperity as, we believe, moves those in whose hands the management rests. It occupies the equivalent position in our speciality to that which the Academy does in the world of Art, or the Royal Society in the world of pure science. To be its President should be the ideal of the humblest student. And why not ? If our science and art is to be a true science and art, it must be a republic of science and of art, akin to that of letters, differing, perhaps, in that its units will sooner pass behind the veil of oblivion, but still a republic in which the best shall rule. It is perfectly true we have not reached this ideal position, perhaps we never may, still individual

labour and merit are not without opportunities of asserting themselves and obtaining just recognition. Among many no opportunity is more readily obtained than through the meetings of the Odontological Society.

This subject is more especially brought to our mind as we have before us the report of the annual meeting, which will be found on another page. We must confess there is a certain meagreness about these reports, with the exception of that of the Treasurer, which render them a little disappointing. We have pointed out what the Society has done in the past and we are concerned to find whether it maintains its position of usefulness in the present. The labours of the Society may be said to be expended in three directions. 1st, its library, 2nd, its museum, and 3rd, its meetings with the papers read thereat and the discussions, these being afterwards printed, forming its Transactions. Now the completeness of a library is relative not absolute. It depends on the relative completeness of the collection of books, not on the mere number which have been brought together. The use of a library of this description depends on this relative completeness. It should not be its intention to supply books which each member should have on his own bookshelves at home. But to be a reference library to which each may go in the sure and certain hope of finding any paper he may want, every information there is to be had. Viewed in this light we very much question whether the Odontological Society's Library is as complete to-day as it was ten years ago. Taking only the Dental Journals, which the Society could probably obtain in exchange for their own Transactions, we believe, that, with perhaps one or two exceptions, no foreign ones will be found on its shelves.

If we turn from the Library to the Museum, we must admit that the Society are very much handicapped by the space which it has at their command. The Society has, we believe, one of the most valuable collections of specimens illustrative of different dental points. On the other hand, unfortunately the arrangement renders them more a collect-

ion of curiosities than a well-ordered museum. We note that Mr. Storer Bennett, the curator, has presented the Society with a large case, which he hopes to fill with specimens illustrative of comparative Dental pathology. This is a beginning which can be followed up with advantage.

The Transactions are undoubtedly the most valued work of the Society. Yet there is a lack of animation about the meetings, the debate is too often confined to the same few. This is admitted and regretted by the Officers of the Society in their private capacity. It seems to us that this is to a great extent due to a natural reticence on the part of Junior members to express opinions at a Society holding so high a position. We think, too, that discussions will be found to be far better maintained when the reader of the paper is one of ourselves and not a distinguished visitor.

Our rôle is rather to call attention to what we believe to be facts rather than to suggest remedies for ills, nor if so inclined, have we space to do so now ; but we do think that by spending their annual income now, on the Library, on the Museum, on the promotion of Scientific Research, on Prize Essays and whatnot, the Society will do better than by increasing the reserve fund, destined for a future some may never see. Nay, we believe they will so better help the future, so place the Society in a better position to meet the call when it comes. There is no such thing as quiescence, if there is no progression then there is retrogression.

THE Deputy Coroner's remarks on "cheap dentistry which were made at the inquest of the girl Fanny Barrett, (see another page,) will, we fancy, heartily meet the approval of most men. We do not, however, see the logic of his remark "Perhaps there are some dentists amongst you, gentlemen," which he addressed to the jury when they omitted to add the suggested rider to their verdict. The fact is good dentists, bad dentists and indifferent dentists all abhor cheap dentistry. The distinction is that whilst the honest ones have their price

and stick to it, the dishonest make great public claims for cheapness, not unmixed with claims for much else, secret methods, philanthropic motives in adding "distressed ladies" etc. etc., but cheapness ceases when they can catch an innocent unawares. Alas! also this "dishonest dentist's work is generally bad. Deception creeps into his work. Gilt and a fine polish cover a multitude of sins. *Pro tempore.*

Manipulative Miscellany.

All new instruments or articles that it is wished to have described under this heading, are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

SALODENT.

UNDER this title Messrs. Burroughs, Wellcome & Co. have introduced a new, and apparently effective antiseptic dentifrice and mouth wash. We understand it to be a combination of solution of salol with eucalyptia, eugenol, thymol, gaultheria, &c., forming not only a most pleasant and refreshing compound when applied to the teeth, but acting as an unsurpassed antiseptic and cleansing medium. Its deoderising qualities being attested by the rapidity with which its use dissipates the unpleasant effects of tobacco smoking, so far as the breath is concerned. It is put up in small bottles, closed with pierced caps, so that a few drops can be shaken on the toothbrush without removing the stopper, an arrangement sufficiently neat and tidy to satisfy the most fastidious.

From the nature of its elements its use cannot fail to be of essential benefit both to the teeth and gums, and the well known skill and integrity of the firm supplying it, is, of itself, sufficient guarantee of purity of manufacture from perfectly innocuous ingredients.

Abstracts of British & Foreign Journals.

THE FRENCH DENTAL JOURNALS.

L'Odontologie for December, contains an article by Mr. Edmund Papot on "TOOTH EXTRACTION, ITS INDICATIONS AND CONTRA-INDICATIONS." He begins by giving a history of the different forms of instruments used in the operation; he then proceeds to consider his subject under the different headings, (i.) Temporary conditions, (ii.) Individual morbid diathesis, (iii.) Age of the patient, (iv.) Position of Tooth, and (v.) State of the tooth and neighbouring parts. Under the first heading, he does not consider pregnancy as a contra-indication except in very nervous and impressionable women. It should, however, be avoided when possible, also during lactation and menstruation. Under the second heading, he notes that in people working in match factories, they should not be allowed to resume work till the socket had thoroughly healed. In epileptics, he would avoid the operation if possible, and if not, do it under anæsthesia. Cardiac troubles, secondary manifestations of syphilis, and diabetes are considered contra-indications. Under Hæmophilia, he says, that when this diathesis is recognised beforehand, one should firmly refuse to undertake extraction. In regard to age, he says teeth should not be extracted after 65, unless they are loose, as owing to the brittleness of the tooth and jawbone, either one or the other will generally be broken. A tooth should be extracted when it causes a fistula on the face, eye or ear trouble, or persistent neuralgia; also when there is exostosis and absorption. Swelling is no contra-indication.

M. Gillard contributes A NEW METHOD OF RETENTION OF THE TOOTH IN IMPLANTATION. A patient came to consult him having the night before broken off one of his teeth, which he wanted replaced. "Do what you think best," said the patient, "but I want something which does not show, and does not irritate me. You know that if your appliance worries me ever so little, I shall have it out before an hour is passed." Pivot, bridge, and plate were alike unavailable for various reasons, so M. Gillard had to fall back on transplantation as

a last resource; the temporary retention of the implanted tooth became the difficulty, as the patient would not even stand a ligature, much less a rubber or metal retention plate. M. Gillard had therefore to devise some extra-alveolar apparatus, and finally, the following operation was adopted. Cocaine was injected, and the tooth extracted. A tooth was then selected which fitted well into the socket. When the bleeding had ceased the socket was syringed out with thymic acid; the tooth was placed in the socket and held firmly with the left hand during the rest of the operation. An incision was made in the gum over the root, and the edges held apart with a little clamp; then by means of an engine drill, a hole was made through the alveolar wall into the tooth at about the upper 3rd of the root, and without going right through it. A platinum pin filed to the exact size of the drill was driven into place with a mallet, cut as close as possible, and smoothed off with emery cones. The wound was again syringed and allowed to close. The tooth was thus held quite firm and comfortable. The operation only took 20 minutes, and caused hardly any pain. The next day the tooth was rather tender, but this soon passed off, and it became quite comfortable.

M. Lot describes a case of NECROSIS OF THE UPPER JAW, extending from the second bicuspid on the left side to the canine on the right and caused by a buried left canine.

M. Lot thus explains this almost unique occurrence:—“The second left bicuspid had through periostitis acquired distinct mobility, and during mastication struck with the end of the root the thin bony septum separating the apex of the buried canine from the second bicuspid, and thus pressed upon the nerves and blood vessels of the canine pulp, setting up periostitis; the purulent matters formed by this periostitis not being able to escape, had caused the necrosis. In treatment all the teeth included in the necrosed portion were extracted, and as the sequestrum did not become loose, after a week's interval a solution of iodide of potassium 1 in 40 of water was injected; this caused violent pain, but the sequestrum became loose and was removed in two days without difficulty. The patient then made a rapid recovery.

M. Paul Dubois calls attention to the use of Aristol in dental therapeutics. Aristol (called also di-thymol) results from the combination of iodine and thymol. It has been used with great success in general surgery as an antiseptic.

It is an amorphous powder of a reddish brown colour, not poisonous nor caustic, and has no odour. It is insoluble in cold water, but is decomposed in water raised to the temperature of 140°. Fahr. It is insoluble in glycerine, slightly soluble in alcohol, very soluble in ether, chloroform, benzin, and the fixed oils. It is recommended for dressings, root-fillings, and capping pulps.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Annual General Meeting, *January 12th*, 1891, Mr. FELIX WEISS, L.D.S., *President*, in the chair.

The minutes of the preceeding meeting having been read and confirmed,

Messrs. Sydney Spokes and F. J. Colyer were appointed Scrutaters of the ballot for the officers.

Mr. Thomas Maudsley Howkins, L.D.S., of Hull, was nominated for non-resident membership.

Mr. J. H. Badcock, M.R.C.S., L.D.S., was balloted for and elected a resident member of the Society.

The PRESIDENT then, in calling upon the officers for their reports, said that the Treasurer, Mr. Thomas Arnold Rogers had prepared a most elaborate and carefully executed report but was unfortunately prevented from tendering it in person.

The SECRETARY then read the Treasurer's Report, which was duly passed.

The LIBRARIAN (Mr. ASHLEY GIBBINS) read his report:—

“I am glad to be able to report that the Library is in a satisfactory condition, and during the year several books of great interest have been added to it. The number of members and students who avail themselves of the privilege of borrowing books is still not so great as I should have expected, and I must again earnestly request those who do so to return the books as soon as they have finished with them, that others may have the opportunity of reading them. The book-cases are now quite full, and during the ensuing year I hope that a

case may be supplied for the books which I am sure some of our generously-disposed members will present to the Society.

“Since our last meeting we have added to the Library:—Dr. Miller’s ‘Micro-organisms of the Human Mouth,’ Fletchers’ ‘Metallurgy’ and Dr. Talbot’s ‘Irregularities,’; and I have also to acknowledge, with thanks, from Messrs. Ash and Sons’ Dr. Blodgett’s ‘Dental Pathology’ and Dr. Fillebrown’s ‘Operative Dentistry.’”

The CURATOR (Mr. STORER BENNETT) said that as he had taken the opportunity at each monthly meeting during the year of exhibiting and describing the specimens which had been received between the meetings, there was little to add in the annual report. He had followed the good precedent set by the Curator of the Royal College of Surgeons of England who habitually exhibited at the Annual General Meeting of the College all the specimens that had been acquired during the twelve months. Mr. Storer Bennett had therefore placed the specimens received during the year upon the tables where the members could inspect them. Although the donations were less numerous than in some preceding years, they were yet of considerable value and interest. He had had the pleasure to offer a 10 feet case to the Museum, which the Council had accepted, and he had nearly filled it with specimens illustrating comparative dental pathology. He thought that being collected together, instead of scattered throughout the Museum as formerly, would render them more convenient for reference. He hoped that before long this series would be more complete than at present.

On behalf of the Council of the Society, the President proposed that Bye-laws II. and V. should be amended.

The following alterations were accordingly put to the meeting and unanimously carried.

That in Bye-law II.

Clause 1. Resident Members shall consist of gentlemen residing in London, or within ten miles of the General Post Office, St. Martins-le-Grand.

Shall read—

1. Resident Members shall consist of gentlemen residing or practising wholly or partly in London, or within ten miles of the General Post Office, St. Martins-le-Grand.

Clause 2. Non-Resident Members shall consist of gentlemen residing beyond ten miles from London.

Shall read—

2. Non-resident Members shall consist of gentlemen practising beyond ten miles from the General Post Office, St. Martins-le-Grand.

Bye-law V. Recommendations for Resident Members shall be signed by two Members from personal knowledge, and by two or more from general knowledge. Recommendations for Non-resident Members may be signed by one member only from personal knowledge, and by two more from general knowledge.

Shall read—

V. Candidates for Resident Membership shall be recommended by four or more Members, two at least signing from personal knowledge. Candidates for Non-resident Membership shall be recommended by three Members, one at least signing from personal knowledge.

Mr. BROWN-MASON (Exeter) described a case of unilateral absorption due to pressure. He said some ten years ago he made the patient upper and lower dentures, the superior maxillary bone being then edentulous, whilst the lower jaw was pretty much in the same condition as at present. The patient, however, to use her own words, "would not take the trouble to wear the lower plate, as she did not see the use of it even if it did not hurt her it was an encumbrance." The result was the bearing being only on the left side; it caused absorption of the alveolar ridge, until it was reduced, as seen in the model, an ink line indicating the free margin of the process, on its outer edge the ridge being, at the back of the mouth, pressed quite half an inch inwards, and very much reduced, in height, as seen as shown by the bite. The strange part of the case was that the patient was quite content, and appeared to get on very well with the denture made when she first consulted Mr. Browne-Mason, notwithstanding that, as the ridge gradually disappeared on the left side, the plate was so tilted that it positively stood away a very considerable distance from the alveolar ridge on the side of the mouth in which there were no opposing teeth. He remarked it was strange that patients would tolerate such a condition, when there is the greatest difficulty in inducing them to wear the most carefully and well-thought-out plates for their comfort. The patient had only lately come back, because her friends complained of the slope which the upper front teeth had taken, and in making a fresh plate Mr. Brown-Mason had to

place the left molars outside the ridge that remained, there being a good bony foundation, as shown in the model, for the plate to rest on. He also exhibited three salivary calculi of unusual size, which formed in the sublingual gland of a gentleman. The patient when on a visit abroad was taken ill, and a very alarming abscess formed under the tongue. On this bursting, three stones came away from the gland. Their weight in the dry state was 4, 5, and $5\frac{1}{2}$ grains respectively.

In answer to a question from Mr. Woodhouse, Mr. Browne-Mason stated that he was unable to say definitely whether these calculi had formed in the duct or the glands, but the medical man in attendance had stated that the latter was the case.

Mr. C. ROBBINS brought before the Society the following cases of interest. The three sets of models shown were from a family in which half of the members showed a peculiar deviation from the normal type, and served to illustrate some of the remarks of the President in his Inaugural Address in reference to marked family peculiarities in the size and form of the teeth. The other members of the family had entirely escaped this condition. Both parents having died a long while ago, it was impossible to obtain information about their teeth, but some cousins were known to have a somewhat similar condition. Mr. Robbins contended that the condition was probably hereditary. The sisters from whom these models had been taken varied in age from about seventeen to twenty-five, and the most marked case was the youngest. In one model it would be observed that the cuspidated condition was so exaggerated that the canine had really become bicuspid. The drawn-out look of the bicuspids and the multiple cusps of the molars were remarkable, there being distinctly twelve small cusps on a molar in the lower jaw.

In case 2 the models presented a somewhat unusual appearance. The patient, Miss M., aged about nineteen, was brought to Mr. Robbins some time ago with the following condition: the absence of permanent central, lateral, and canine teeth on the left side, the jaw being in consequence feebly developed about this region. On the right side the temporary canine still persisted, and portions of the temporary roots were helping to keep the bicuspids from their normal position. This remark did not apply to the first bicuspid of the left side, as there seemed no cause for its coming in such an oblique, almost horizontal, position, so that Mr. Robbins mistook it at

first for the non-erupted canine. This family was also noted for its abnormalities in dental matters. One sister had an upper temporary persistent, with the permanent canine taking the place of the non-erupted lateral. The brother was deficient in some of his bicuspid, and had the inferior canine pointing almost horizontally towards the tongue. The treatment adopted was simple enough. An effort was made to regulate the bicuspid into their proper position, after the extraction of the temporary canine and the roots. The patient would not bear the regulation frame, Mr. Robbins therefore made a simple vulcanite case to fill up vacancies. The patient's mother seemed to attach some importance to the fact that at the age of two and a half years the child had a severe fall, breaking off some of the temporary teeth. Although the patient looked well developed, she had never been strong, and had always evinced a desire to be biting something, when not eating, similar to that of a child during the first dentition.

The third case was that of Miss M., aged about twenty-six, who met with a tricycle accident, and as one of the results fractured the upper right central and lateral. The upper teeth were of the spreading-out sort, and the lower lip was lacerated by them in the fall. About a quarter of each tooth was broken off obliquely, yet, strange to say, the pulp was not exposed, or even much irritated. The patient came to Mr. Robbins principally on account of the sharp edges of the broken teeth irritating the swollen lip. He advised excision of the crowns, and the fitting of two pivot teeth. The patient desired that he should carefully examine the hard swelling of the lower lip, and after doing so the suspicion was confirmed that there was a portion of the tooth in the lip. The patient was advised to consult the medical man again, with a view to having the fragment removed from the lip. This was attempted without success. About this time she left the country for a while. Six months ago the patient came again, and reported that eventually (about three months from the time of the accident) the fractured portion of the central came through the front of the lower lip, about half an inch below the spot at which it had been supposed to have entered.

The fourth case closely resembled the case just mentioned. It illustrated how nature will sometimes tolerate even sharp and most unlikely foreign substances in the moveable tissue

without much inconvenience to the patient. At the age of three a boy was playing in the drawing-room. His mother was on the lawn, and called him. He, being ignorant of the nature of French windows, made a rush through the window breaking the glass and cutting himself badly. The mother stopped the bleeding until the old family doctor arrived. No attempt was made to probe for pieces of glass, and in course of time the cuts healed up, and although the boy always declared that he had two pieces of glass in his cheek, no one believed him. They gave him very little inconvenience, but at the end of thirty-three years he felt a sharp point inside his cheek, scratching his gum, and in the course of the day he managed to wriggle it out. The piece of glass measured seven-eighths of an inch in length by a quarter of an inch at the widest part. This specimen, with the models, were presented to the museum. The patient was present, and many members examined his cheek, where another piece of glass could easily be felt.

The PRESIDENT said that the last case illustrated very forcibly how long foreign bodies might remain in the living tissues without any serious results. The case was quite unique.

Mr. C. S. TOMES remarked that very great interest attached to the models exhibited by Mr. Robbins, because of the light which they threw on the genesis of cusps. The bicuspid were all stunted in point of size, but the stunting was not merely in size, for it had fallen mainly upon the inner or latest acquired cusp, whilst the outer or original cusp, corresponding with the one cusp of the canine, was of full size. The bicuspid in fact, consisted of an outer cusp, to the inner side of which was a cingulum, hardly elevated into a cusp at all, so that the teeth demonstrated very prettily the relationship of canines and bicuspid. It was to be regretted from a morphological point of view that the molar had not undergone a similar stunting, though one of them did show in an almost diagrammatic manner which was the primary cusp, homologous with the cusp of the canine, and therefore which were the superadded cusps, though no light was thrown upon the order in which they were added.

Mr. WOODRUFF showed the models of a patient's mouth, aged thirty-five, in which, whilst all the teeth on the left side

articulated perfectly, those on the right side from the bicuspid backwards did not meet, the space between the upper and lower jaw when the mouth was closed being fully an eighth of an inch. One bicuspid of the upper set on either side and the lower wisdom teeth were missing, but beyond this both the teeth and the jaw were well developed, and there was no history of mechanical treatment having been attempted nor of accident nor cicatrix to account for the abnormality. Mr. Woodruff thought it might be interesting to the members of the Society, and although he could offer no explanation himself, would be glad if any member present could throw any light on the matter or suggest a cause.

Mr. RILOT read a Casual Communication.

The first case was a model of what, for want of a better description, might be called an abnormal tooth. It was brought to his notice as a case of gemination of permanent incisors, but on examination this view became hardly feasible, on account of the size of the specimen. It must, then, be either retained geminated temporary incisors, or an abnormal double-crowned lower incisor. If it had been temporary, the two teeth were unusually large, while such a thing as a double-crowned incisor was, as far as was known, an unheard-of abnormality. Taking, therefore, what hypothesis one might, there were elements of uncertainty. It might be added that the neck was very constricted, and it could not be determined whether there was any bifurcation of the root. The patient's age was about thirty : and he could give no information as to the time of its eruption. It was very firm, and there was no sign of any other tooth.

The second case was one of intense facial neuralgia, relieved by a very slight operation. On the 16th of last November, Mr. Rilot was asked by the house-surgeon of the North-West London Hospital to see a case of neuralgia in the wards under the care of Mr. Frederick Durham. On seeing the patient it was at once evident that she was suffering intense agony ; the well-known outward and visible signs of neuralgia were present in the tense, shiny skin, and heightened colour of one side of the face. Every time she opened her mouth to talk, or take food, the pain came on in great intensity. According to the patient's description it began in the right upper jaw, and thence radiated to the whole of that side of the face. It appeared from the previous history of the case that the trouble came on about six months

previously ; the patient was then seen by Mr. Mayo Collier, who prescribed Ammonium Chloride and Tr. of Gelseminum, which quickly relieved her. When the trouble returned the second time the same prescription was tried, but without the least effect. Mr. Rilot was then asked to see her, as Mr. Durham thought there might be some buried roots, and she said she felt something there which, on being touched, started the pain. When he came to examine her he found that the least touch, even with a silver probe, brought on a paroxysm of pain. He therefore had her put under chloroform, and made a thorough examination of the jaw. The sockets of some teeth which had been removed some time previously had not thoroughly healed up, but there was neither bare bone or buried root. A little piece of bone (probably the piece the patient felt) which was resting on the surface attached to the gum, was removed. She was sent back to Mr. Durham saying that no local cause was discoverable. The interesting part of the case was, from that moment the patient experienced absolute relief, and after being kept in a week to see if there were any recurrence, she was discharged well. Whether the cure will be a permanent one remains to be seen. But at all events, the fact remained that absolute relief was afforded, either by the probing, the removal of that tiny piece of bone, or the chloroform.

Mr. H. BALDWIN wished to mention, in connection with Mr. Rilot's case, one which he saw some time ago. The patient, a healthy young man, had had a tooth extracted some long time previously—a molar in the upper jaw. The socket healed up, but when he came to Mr. Baldwin he was suffering intense pain, which he referred to this point. Mr. Baldwin probed this depression with a sharp probe, and advised the patient to allow him to make an incision across the depression. This was done, and the patient wrote and told him that he had had absolutely no pain since.

In reply to Mr. H. Lloyd Williams, Mr. RILOT said that roughly speaking, the piece of bone removed was situated in the position the first molar had previously occupied.

The PRESIDENT then delivered his Valedictory Address. (See page 153.)

The result of the ballot being declared the following members were elected as officers and councillors for the year 1891 :—

President—S. J. Hutchinson.

Vice-Presidents—Resident—J. Stocken, David Hepburn and T. H. G. Harding. *Non-Resident*—W. Bowman Macleod (Edinburgh), J. H. Redman (Brighton), and R. T. Stack (Dublin).

Treasurer—Thomas Arnold Rogers.

Librarian—Ashley Gibbings.

Curator—Storer Bennett.

Editor of the Transactions—Walter Coffin.

Honorary Secretary—J. Ackery (*Council*), W. A. Maggs (*Society*), and F. Henri Weiss (*Foreign Correspondence*).

Councillors—Resident—C. S. Tomes, F.R.S., Willoughby Weiss, W. H. Woodruff, W. Hern, F. Newland-Pedley, C. J. Boyd Wallis, F. J. Bennett, Cornelius Robbins, and E. G. Betts.

Non-Resident—M. de C. Dickinson (St. Leonards-on-Sea), A. A. de Lessert (Aberdeen), Alex. Fothergill (Darlington), W. B. Bacon (Tunbridge Wells), H. B. Mason (Exeter), Mordaunt A. de C. B. Stevens (Paris), T. S. Carter (Leeds), Edmund Binns (Middlesbro'), W. S. Woodburn (Glasgow).

Mr. T. CHARTERS WHITE proposed the vote of thanks to the President, and in doing so spoke of the affectionate regard in which he was held by all who knew him.

The PRESIDENT briefly responded.

Mr. MORTON SMALE proposed, and Dr. JOSEPH WALKER seconded, the vote of thanks to the officers which was acknowledged by Mr. ACKERY.

The next meeting of the Society will be held at its rooms, 40, Leicester Square, on Monday, Feb. 2nd, at 8 p.m. Business : Paper by Dr. Silk, "Clinical Observations on Bromide of Ethyl as an Anæsthetic in Dental Surgery, with Recorded Cases ;" Casual communications by Mr. Sewill on "The Etiology of Empyema of the Antrum ;" Mr. T. Charters White on "A new Method of Demonstrating Dental and Osseous Tissues in Microscopical Specimens ;" Mr. Storer Bennett on "A Case of Alveolar Abscess of Three Years' Duration, due to Perforation of the Side of a Root ;" Mr. Ackery on "Some Cases of Eruption of Teeth in Abnormal Positions ;" short introductory address by the President.

DISCUSSION ON DR. RICHARDSON'S PAPER.

Continued from page 141.

Mr. DAVID HEPBURN said Dr. Richardson had mainly referred to cases where a definite socket had to be dealt with, those were the simplest. Those which gave the most trouble were the instances in which practically no socket existed; *e.g.*, when a loose tooth had been taken from a flabby gum, and where the application of a strong remedy would simply create a new source of trouble. He was of opinion that the less the gum was irritated by strong applications the better. In those cases where pressure might be applied he had always found it desirable in the first instance to take an impression of the mouth before irritating the gum, then apply a splint, which should be a permanent one. With the present means of rapidly vulcanising, and packing upon a model, a splint could be turned out in one-and-a-quarter hours. In these cases he had found the greatest advantage arise from enveloping the gum with lint saturated with perchloride of iron, then applying the permanent splint and bandaging the jaw.

Mr. S. J. HUTCHINSON said that, in his judgment, there could be no doubt whatever that where there was a history of hæmorrhagic diathesis, treatment beforehand was very advisable, and in male patients ergot of rye might be used with advantage. Unfortunately the history in these cases was, nine cases out of ten, learnt after instead of before, the operation. Mr. Woodhouse's use of the silk ligature was a most admirable plan; he found it also very useful when the first piece of silk had been tied round the tooth to thread it through a plug of amadou, so keeping this last in position. In employing Mr. Hepburn's excellent suggestion it was well to plug the sockets before taking the impression.

Dr. RICHARDSON, in replying to the various speakers, said it had been the ambition of many men to hope that some of the things they had done should be remembered after their deaths and to wish that they could hear the recognition. Well, he was not dead, but he experienced no small pleasure in hearing two of the speakers, Mr. Bennett and Mr. Woodhouse, expressing themselves favourably of styptic colloid and peroxide of hydrogen for both of these remedies were his own introductions into practice. Peroxide of hydrogen discovered in

1818 by the distinguished Baron Thénard, remained a chemical curiosity, until he (Dr. Richardson), in 1858, began to use it medicinally, first in diabetes, then in pulmonary consumption, and afterwards as an external remedy as well as an internal Styptic colloid he first made, or invented, as well as introduced, and he had also originally made and used carbolic colloid, for many years, as a combined styptic and local anæsthetic. Mr. Bennett, in using peroxide of hydrogen as a styptic, had seen varying results because he had been using a different substance at different times. In order to keep the oxygen fixed in the peroxide solution some chemists add a small quantity of nitric acid, and then the solution is a styptic by virtue of the acid; but in itself the peroxide could not be called, strictly, styptic although by the escape of the oxygen the blood no doubt, is slightly thickened, a very curious fact not yet explained. The use of the extracted tooth as a plug had not been successful in his (the speaker's) experience, although he had often known of its having been used in the manner the President had mentioned. Referring to Mr. Newland-Pedley's observations, he would be only too happy to confirm, if it were possible, that gentleman's views as to the mode of preparing a patient's suffering from the hæmorrhagic diathesis with fluid blood for an operation that should be free of danger. The administration of perchloride of iron in such cases was an old practice and was a common practice, but there was no proof whatever that it had the practical effect of increasing the plasticity of the blood. Indeed, in one of the very cases in which attention had been drawn, the sufferer had been through a long medical course of this kind but without any protective result. The nature of the hæmorrhagic tendency was always a question of diagnosis, as to whether it depends upon fluidity of the blood or upon failure of the arterial control. Mr. Hutchinson had spoken of the value of ergot for suppression hæmorrhage there again it was a question of diagnosis. Ergot would have no effect for good, but rather the reverse, if the blood were abnormally fluid, while it might be of great service if the flow of blood were due to deficient arterial tone, for the action of ergot was not as a styptic, but as a substance which causes contraction of organic muscular fibre. Of the value of amadou Dr. Richardson could not speak in the same terms of condemnation as Mr. Hutchinson. Amadou had a certain styptic effect, but in extreme cases, such as were referred to in the paper, it had

been of little use in his (the speaker's) practice. He agreed with Mr. Hepburn in the method of making a mould for compression where there were no teeth on each side the bleeding point or where there was not efficient socket, and he thought that an immediate mould might easily be made out of the styptic percha which he had placed before the Society. In conclusion, Dr. Richardson thanked the members for the kind attention they had bestowed on his paper, and to Mr. Thomas A. Rogers especially for his most kind observations.

The usual vote of thanks having been duly carried, the President announced the Annual General Meeting of the Society would be held at 40, Leicester Square, on Monday 12th January, 1891, at 8 p.m. Business: the Elections of Officers, &c.; short Valedictory Address by the President. Casual Communications by Mr. S. J. Hutchinson "On Eruption of Permanant Lower Canines, at nine to ten years, and Mr. J. F. Colyer on "A Case of Lupus." Messrs. Robbins, Woodruff, Rilot and others, subjects not given.

MANCHESTER ODONTOLOGICAL SOCIETY.

The usual monthly meeting of the above Society took place at the Victoria Dental Hospital, on Tuesday evening, the 2nd of December, the President, Mr. H. Campion, in the chair.

Mr. Thomas Tanner, was unanimously elected a member of the society.

THE LIBRARY.

Mr. G. G. CAMPION said he had a communication to make about the Library which, he was glad to say, was getting gradually larger. Each of the members had been furnished with a list of the books which the Library Committee decided to purchase, and of those some were promised, or had already been presented. They were indebted to Dr. Shaw, Mr. Rogers and Mr. Murphy, for large and valuable donations of books and journals. The Library Committee was anxious to procure a complete series of past volumes of the different dental journals, and would have to rely largely on the individual help of members to do this, as it was not always possible to purchase them. He should be glad at any time

to send for any books which the members might be willing to present.

The PRESIDENT remarked that it was very desirable that those gentlemen who were going to present books, should do so at once, in order that the Library Committee might begin getting those books which it had been decided to procure, but which had not been given to them.

They had the bookcase waiting for the books, and the sooner they could be brought to the use of the members the better. The ready response which had been made showed how much the library was wanted, and from the interest the members displayed in it, he had no doubt that in course of time it would become a very valuable one to the members of the profession in Manchester.

The following demonstrations were then given.

Mr. A. B. WOLFENDEN administered to several patients Dr. Frederic Hewitt's anæsthetic mixture of nitrous oxide and oxygen.

Mr. WM. SIMMS showed a method of preventing the rotation of some forms of pivotted crowns by inserting a steel screw through the lingual portion of the plate covering the face of the root into the dentine of the root itself.

Mr. G. G. CAMPION demonstrated the insertion of a glass inlay in an upper central incisor, using Richter's materials.

The usual monthly meeting of the above Society took place on Tuesday evening, January 20th, at the Grand Hotel, Aytoun Street, the President, Mr. H. Campion, in the chair.

CASUAL COMMUNICATIONS.

Mr. SIMMS said that a few months ago he had inserted a denture for an African native, and at the time he had some conversation with him as to the methods employed by the natives of Africa in cleansing their teeth. Since his return to Africa the gentleman had sent him (Mr. Simms) some of the tooth brushes used by the natives, and which were nothing more or less than the branches of certain trees, with which they vigorously rubbed the teeth. One of the pieces of wood had an astringent taste which might be of use to the gums.

Mr. G. G. CAMPION said that he had that afternoon seen a gentleman who two years ago had visited the Shire district of East Africa, and who was particularly struck with the beauty of the native's teeth. His statements quite corroborated what Mr. Simms said, that the natives had spent an im-

mense deal of time and trouble in keeping their teeth clean and white.

Mr. COLLETT said he exhibited nearly two years ago some ornamental tooth sticks which came from Africa. They were made of a fibrous root, and in order to render them like a tooth brush, the natives hammered them on a stone.

Mr. W. HEADRIDGE said the most perfect set of teeth he had ever seen were those of a patient he had had from the African region.

Mr. P. HEADRIDGE said he had had a patient from Japan, who assured him that little packages of what was called "soap-wood" were sold in the markets in that country and used by the natives to brush their teeth.

Mr. MINSHALL exhibited two teeth, one a left lower wisdom with three well defined roots, and the other a dilacerated upper central which he had to extract, owing to its protruding so far out as to cause ulceration of the lip. He also showed models of a boy's mouth, of 16 years of age, both the mother and the boy assuring him that he had never had a tooth extracted. In the upper jaw he had but nine teeth, all of them perfect with the exception of the left canine, which was a little loose. On the right side of the lower jaw he was without the central, one bicuspid, and the six year old molar; on the left he had no incisors, only a temporary canine, two bicuspids and one molar which required filling.

The PRESIDENT said he remembered a case when he was at St. Bartholomew's Hospital, London, in his younger days, where a youth of 17 or 18 years of age, had only three of his milk or temporary teeth in the lower jaw, and six or seven in the upper; these being the only teeth he had ever had.

Mr. P. HEADRIDGE said it would be interesting to know if there was any defect in the parents to account for the peculiarity of the boy's teeth.

Mr. MINSHALL said that there was no such defect in the boy's parents as Mr. Headridge suggested.

Mr. SMITHARD exhibited a face piece made by himself, in which the part usually of leather, was made of American cloth and lined with rubber dam.

The discussion on the Demonstrations which had taken place at the previous meeting, was opened by Mr. Collett, who said he wished to thank Mr. Wolfenden for his demonstration on Dr. Hewitt's mixture of oxygen and nitrous oxide. They were all interested in anæsthetics, and they

ought to know anything fresh that was going on. Mr. Wolfenden certainly demonstrated to them how successfully a mixture of nitrous oxide gas and oxygen could be given. Whether it would be advisable to always use it was another thing. An objection to it was the rather cumbersome apparatus, which was liable to get out of order, and would probably necessitate an additional person in the room to look after it. One advantage of the mixture was that persons under its influence did not turn livid in colour. The gain in time, however, was not so great as he expected. In regard "inlays" inserted by Mr. Champion, they certainly looked very beautiful, but the question rose in his mind as to whether they would last, as it had been said that any vitreous material that would fuse as easily as this composition could not possibly last, but that it would be acted upon more or less by the acids in the mouth. Whether this was so time would show. For his own part he should be inclined to think that unless the inlays were made exactly to the size of the cavity they were intended to fill, that whatever material they were inserted with, whether it was "Fletcher" or "Fossiline" would be ultimately dissolved away.

In answer to a question, Mr. SIMMS then gave an explanation of the details of his demonstration. He said it was simply an attempt to so fasten a pivot tooth as to prevent its rotation. The rotation was the force which ultimately loosened the tooth, and the method which he showed and which he had used in several cases was this:—The tooth being prepared and ready for inserting, he drilled through the palatal margin of the plate covering the root and also into the root itself a hole into which he inserted a steel screw. The gold which had been flushed over the plate was countersunk to allow the screw head to pass into it and this was then filled over with gold or gold and tin. He thought this was preferable to some of the methods recently brought out, in one of which a square pin was advocated. It was very desirable to use a round pin, as it was easy to rotate the tooth to get it up in a way which was impossible with the square pin. He found that with additional practice he could perform the operation with expedition. He had so far always found room in the roots, though of course there might not be in the case of some laterals.

THE PRESIDENT asked Mr. Simms whether he had tried the plan of making the face of the root concave from side to

side to prevent rotation. He had always been in the habit of doing this, and had never found any difficulty from the teeth rotating. The mere fact of the root being cut in that way, prevented anything like rotation, and then all depended on the tooth being firmly fastened. It seemed to him that the second pin would tend to weaken the root and prevent its lasting as long as it otherwise would. It would also afford a second place for the root to perish in, as they generally failed round the pin.

MR. WHITTAKER advocated making the face of the root saddle-shaped—concave laterally, and convex antero-posteriorly.

Referring to the anæsthetic mixture, The President asked whether there was any difficulty in knowing when the patient was under its influence.

MR. COLLETT said the limbs became very placid, the breathing remained normal, there was no change of colour. But it was claimed that an overdose could not be given. The period of administration was considerably longer, and there was consequently a risk of beginning the operation before the patient was thoroughly under its influence. Dr. Hewitt advised $12\frac{1}{2}$ p.c. of oxygen and the rest nitrous oxide.

MR. MORLEY, who extracted the teeth whilst the patients were under the mixture, said that on the whole it was very successful. The patients were very quiet, with the exception of one who was inclined to be hysterical. He did not think the period of anæsthesia was at all prolonged, and the apparatus was somewhat cumbersome.

MR. MINSHALL said that Dr. Hewitt now only recommended 10 per cent. of oxygen in the mixture.

The PRESIDENT said that the chief point in favour of the new mixture seemed to be that perfect safety was claimed for it, here all seemed to agree, and that the period of anæsthesia was not prolonged as compared with nitrous oxide.

MR. G. G. CAMPION said that the general impression of the new mixture seemed to be that the period of anæsthesia was not increased. He could only account for it on the ground that the apparatus was faulty, or that the mixture was imperfectly administered, as when he saw Dr. Hewitt administer it, the period of anæsthesia lasted 45 or 50 seconds, which was a distinctly longer period than was obtained with nitrous oxide. Dr. Hewitt usually gave the gas under pressure. He was not sure whether this had been done in these

cases or not. (Mr. Collett : Yes.) It took a considerably longer time for a patient to succumb to its influence than to that of nitrous oxide, and to those who were unacquainted with it, the usual indications of anæsthesia were absent. There was a complete absence of hysteria. With regard to the inlays, he had no experience as to their durability. He had in his demonstration used Richter's materials and found he could not always rely on the "inlay" coming out the exact colour wanted. Dr. Herbert used ordinary glass beads which he ground up in a mortar, and he obtained what colour he required by the admixture of different coloured beads. He thought the "inlay" would last as long as necessary, the question of colour was the only difficulty.

Mr. P. HEADRIDGE pointed out the difficulty of using the "inlay" where the teeth were denuded in front.

MR. CAMPION said it was not claimed that they would be useful in all cases.

MR. SMITHARD said he differed from Mr. Campion, as to the value of the anæsthetic mixture, he found that the patient was longer in succumbing to its influence, and was insensible for a shorter period than with the nitrous oxide alone. He found that with the latter, the average period of anæsthesia, was quite as long as Mr. Campion stated Dr. Hewitt to obtain with the mixture.

Dental News.

GLASGOW DENTAL HOSPITAL.

The annual meeting of the subscribers to the Glasgow Dental Hospital was held on January 30th, in the Religious Institution Rooms, Buchanan Street—Sir James King, Bart., in the chair.

Mr. D. M. Alexander, the secretary, read the report, from which we make the following extracts :—

"During the past year the hospital has maintained its position as one of the useful public charities of the city. It has dealt with and alleviated a large amount of suffering in

an acute form among the poor of the city. Although in its present situation the hospital is not so accessible as in its former central position in George Square, it has been largely taken advantage of by the public. During the year, 4622 patients were treated. Of these, 3391 were cases of extraction and 1231 cases of preservative operations. The growing proportion of the latter class of cases shows that the work of the hospital is being largely devoted not only to the removal of pain, but to its prevention. These preservative operations form one-third of the whole of the cases, whereas last year they only amounted to one-fifth. The finances of the hospital have improved during the year. The deficit of £63 15s 10d. with which the accounts for last year closed, has been reduced to £12 1s 9½d. This has been brought about by a reduction of the expenditure, and by an increase in the sum derived as fees from students attending the hospital. The directors regret that the contributions from the public show a slight decrease. These amounted for the year to £109 6s 6d. as compared with £119 10s 2d for the last year. The directors are anxious that this source of income should be increased rather than diminished. There are few of the public charities which accomplish so much good in the way of helping the distressed poor at so little cost, the whole normal expenditure being under £250. An annual contribution by the public of £200 would be sufficient to enable the directors to carry on the work with efficiency; and they trust they will not appeal in vain to the citizens of Glasgow to support them to this moderate extent in carrying on what has proved to be a much needed public institution. The directors have pleasure in making acknowledgment of a generous gift to the hospital by Mr. James Wallace, dentist, Glasgow, of a sum of £100 for the purpose of fitting up a laboratory, and providing a prize of £20 per annum for four years for competition among the students of the hospital for excellence in mechanical and hospital work. They have also to acknowledge the generosity of the lecturers in the hospital, who have again this year given their proportions of the hospital fees as a donation to the general funds."

The Chairman, in moving the adoption of the report, said he was glad to recognize the continued and increasing usefulness of the institution. The progress of medical science and the comforts of modern life had added in no inconsiderable degree the average duration of life, but as regards the preserva-

tion of teeth from decay he feared the very reverse held true ; indeed, to an extent unknown, so far as he was aware, in previous generations there was required nowadays more care both to preserve the teeth from decay and to lessen the suffering which resulted from neglect. There was no doubt that up to the time this institution was set agoing those who on the one hand suffered the most acute of all pains—that connected with disease of the teeth—and who, on the other hand, had empty pockets, were in sorry case indeed. But, as was always the case when an hospital was started, the leading professional men came forward in the most praiseworthy manner and placed their skill at the service of the public free of charge. They would have expected that as so good an example had been set by the medical men, the citizens of Glasgow would have been ready to do their part. Hitherto this had been very imperfectly done ; indeed, so far as he knew, the only handsome donation to the institution came from a professional gentleman. To him every credit was due, and he (the chairman) hoped the example would stimulate wealthy and philanthropic men to do something considerable towards the support of so deserving an institution. (Applause.) The accounts shewed that the institution had been conducted with praiseworthy economy, and in looking over these accounts he had been very much struck to find that the fees paid by students exceeded the total subscriptions received from the public. That was a very unsatisfactory state of things from one point of view—he meant as regards the public ; but, on the other hand, there could be no higher certificate both as to the extent and the value of the work that was being done when so many students paid fees in order to receive the experience that was to be gained in the institution. He was glad to have an opportunity of recommending the benefits of the hospital to the public, and surely if only the collectors were to happen to call when anyone was suffering from a twinge of toothache he would not go away empty handed. The extent of work as shown in the report was year by year increasing, and among the 4622 patients who were treated during the year, no fewer than 1231 had had the benefit of preservative operations. (Applause.)

Mr. Waddel seconded, observing that he hoped the remarks made by the chairman might be the means of bringing out more funds to assist in the carrying on of the work of the hospital. (Applause.)

The report was adopted.

On the motion of Mr. Brownlie, seconded by Mr. Young, office-bearers were appointed for the year.

Mr. James Wilson of Bantaskine moved a vote of thanks to Sir James King for presiding.

This was agreed to, and thereafter the meeting separated.

THE LIVERPOOL DENTAL HOSPITAL.

The meeting of the Liverpool Dental Hospital was held on the 5th February at the institution, 60, Mount-pleasant. Sir James Poole presided, and there were among those present Drs. Dawson and Waite, Messrs. G. Wynne, H.C. Quinby Royston, J. R. K. Scott, H. E. Brakell, C. Birchall, R. Edwards, J. Wannop, W. L. Jackson, E. Buckley Pidgeon, E. A. Davies, M. Alexander, and J. A. M'Nair. In the annual report it was stated that during the past year there had been 19,760 patients treated, and 27,049 operations carried out. The northern branch had been closed on account of financial difficulties, and because the dental staff desired to devote more of their resources and time to the development of the hospital. The Committee were of opinion that considering the amount of work done in the hospital, it was worthy of better support. Thanks were given to the friends of the late Mr. T. F. Brakell for the gift of appliances as a kind of memorial of the deceased gentleman. The financial statement showed that the expenditure amounted to £420 and there was a balance of £15 due to the treasurer. The Chairman, in moving the adoption of the report and statement of accounts, said that the hospital continued to find favour with the public, and the number of patients treated there was a proof of the enormous benefit it had been to the public generally, and particularly to the people who could not have afforded to obtain relief elsewhere. The appliances which had been presented would enable the students to gain a better insight into their work, and in prosecuting their studies they would no doubt be greatly stimulated by the kind gift of £20 per year for five years from Mr. H. C.

Quinby to be presented to the two most successful in their examinations. Dr. Dawson seconded the motion, and it was carried. Votes of thanks to the president, committee, etc. consulting physician, consulting surgeon, and dental staff were given, and the prizes from Mr. H. C. Quinby were then presented to Mr. W. H. Gilmour and Mr. L. J. Osborn, who had respectively passed first and second in the examination. The thanks of the meeting were offered to the chairman, and the meeting closed.

THE HOSPITALS COMMITTEE.

THE Select Committee of the House of Lords to make inquiries with regard to the London hospitals and other institutions for the care of sick poor having been reappointed on Friday, January 23, resumed their sittings on January 26th, under the presidency of Lord SANDHURST.

Mr. LUSHINGTON, the Treasurer of Guy's Hospital the first witness, at the time he was elected treasurer, fifteen years ago, the nursing was that the sisters in charge of the wards were not trained nurses, and knew little or nothing of their duties. But that had been changed. The hospital was founded by Guy about 1735, and in his will he defined what should be its constitution. It consisted of sixty governors self-elected. Out of that body of governors there was a Court consisting of nineteen members, and this Court practically discharged the whole business of the Hospital.

But besides the Court, there were sub-committees for the consideration of important subjects. The hospital had three large estates—in Hertfordshire about 10,000, in Lincolnshire about 13,000, and in Essex about 9,000 acres. There was also an estate in Southwark, round about the hospital, which produced about £6,000 a year. The estates used to give about £50,000 a year, but that had greatly fallen off in consequence of the agricultural depression. They had lost in Essex quite 40 per cent. of their rents, and in Hertfordshire and Lincolnshire from 24 to 30 per cent.

We have a net amount to spend on the Hospital of about £25,000 or £26,000.

There is a certain income from the lady pupils, from the out-patients and the in-patients, and we have further raised £100,000 from the public.

Ours is the only hospital near, and yet for want of funds we are obliged to keep over 100 beds closed.

There were resident surgeons until recently living in the hospital, and at its expense, and they had their meals provided at the expense of the hospital. When the College was opened in May they went over to the College, and the College authorities were paid the cost.

But we have a medical officer and surgeon on duty, who sleep in the hospital, and they are called down in case of an accident in the night.

The WITNESS then gave evidence as to the nursing department at the hospital, and stated that a separate account was kept as to the nursing, although it was included in the accounts of the hospital. Besides the hospital nurses they had an Institute of Nurses for sending out private nurses. He did not think the hospital patients suffered at all on account of nurses being withdrawn from the hospital for the Institution. It was certainly not their practice to take nurses out of wards to send out as private nurses.

I think we have nearly twice as many surgical as medical cases. There were, he added, a large number of out-patients; they now had to pay a small sum.

Dr. EDWIN COOPER PERRY, F.R.C.P., Assistant-Physician to Guy's Hospital, Dean of the Medical School, Demonstrator in Morbid Anatomy, and Warden of the residential College, stated that the fact of a gentleman not having a diploma of the College of Surgeons or the College of Physicians, London, did not prevent his getting an appointment at the hospital. The Medical College was for the residence of the students, and of the total number of nearly 500 there were 52 residing in the College. His functions came under two heads—namely, the business management of the College, and the superintendence of the students as regarded discipline. Having given in detail the recent history of the College, the Witness stated, in reply to the CHAIRMAN, that it was a commercial speculation, and no part of the hospital money had been used for the building.

As to the medical school, the number of students had considerably increased of late years. In 1886 the full students—those who had entered for the full curriculum—numbered 69.

In 1887 the number was 64 full students ; in 1888, 74 ; in 1889, 85 and 6 dental students ; and in 1890, 101 with 16 dental students.

As regards the large medical schools, a central university would be of little value, because those schools could afford to give adequate remuneration to their lecturers, demonstrators, and teachers. But, as regards the smaller hospitals, I think that there can be no question that it would be better to have a central institution for teaching the scientific parts of the three professional subjects. The remuneration came from the fees of the students, which formed the school funds. Last year the income from the students' fees amounted to £11,000. Of that sum about £3,000 was spent in carrying on the school.

At the meeting on January 29th, Mr. W. H. CROSS, Clerk to St. Bartholomew's Hospital, stated, in answer to the Chairman, that the affairs of the hospital were conducted by an executive committee and a house committee. Having given details of his own duties, the Witness stated that he was a salaried officer and resided on the premises. His salary was £1,000 a year. He would, of course, receive any complaints and in case of anything serious the steward would report to him. The steward was an important official, and kept a record of patients and saw to their allocation.

THE CHAIRMAN: As a general rule, do you not think it an inconvenient system to have two heads, as it were? You are supreme in the absence of the treasurer, and at the same time you have a very important official who is not directly under you? It would be much better to have someone on the spot who had supreme authority.

That the house committee dealt with the estates of the hospital, which were in various counties, and comprised about 11,000 acres. The principle estates were in Essex, and the hospital had an agent in Chelmsford. The treasurer and almoners visited the estates when necessary in case of change of tenants or otherwise. The almoners were four in number, and each held office for four years. They were, as a rule, men of large business experience. The system of inquiring into the circumstances of the outdoor patients at St. Bartholomew's had worked well. He thought there should be an inquiry officer at each of the general hospitals. The patients who came to St. Bartholomew's were very poor.

Dr. NORMAN MOORE, F.R.C.P., stated that there was no

dean at the hospital. He was assistant-physician, lecturer on pathological anatomy, and warden of the College in which the resident students were received. There were about 500 students, and the hospital had maintained that number for many years. They could conveniently teach a little larger number than that. In the residential college they could accommodate about twenty-seven students. He had powers of discipline over the students, and was, under the Committee, the highest authority, apart from the government of the hospital as a whole. He was in favour of schools being attached to large hospitals, and, if they compared the results of medical education in England with that in other countries, there was no reason to think that the English was the less good. He had not been to Vienna, but he was well acquainted with the system of medical education there. The teachers in London would bear favourable comparison with those of any countries. The general moral training of medical students was superior to that given in any country. Whether they had many good lecturers depended upon the ultimate rewards to be obtained from successful teaching, and those rewards were greater here than elsewhere. By a central university they might secure as good but not better lecturers than at present. It would be useful if students of medicine were taught chemistry at public schools. A great laboratory might form a part of a central university, but he did not think it was a public want, because there were good laboratories in England. He would not by any means say the method and means of medical education were not capable of improvement. With regard to the out-patient department of the hospital, on the whole it worked with advantage. It was impossible to see a large number of out-patients unless done systematically. The patients could not, he thought, be seen at the rate of sixty an hour. The Witness then denied some of the statements made by previous witnesses as to the neglect of out-patients. In former years no doubt the arrangements were less perfect than at present. The staff had been enormously increased and the system reorganised. From his experience the free departments of St. Bartholomew's were not abused. It was a very rare occurrence for anyone to come who could afford to pay for good medical advice. He was strongly in favour of maintaining the out-patients departments. If not maintained they would do a serious injury to the progress of medical education. And besides, that was the only way of preventing the neglect of

the sick poor. A student could attend more than one London medical school. If dismissed from one, it was not very likely he would be able to go to another school, because of the communication between the heads of the school. The students' fees last year amounted to £14,000. Out of that they had to pay the whole of the expenses to the school and the different lecturers. The school expenses last year amounted to over £4,000. The expenses included all the servants, a large museum, a considerable library, and the working expenses of the lecturers. The amount of fees the lecturers received depended upon the number of students who attended his classes. The residential college in the hospital was part of the property of the governors, and practically paid its own expenses.

He was opposed to special hospitals, as in most of the so-called special diseases—particularly cancer and chest complaints—the cases could be treated at general hospitals.

LEGAL.

(Before Mr. JUSTICE WRIGHT and a Common Jury.)

Nouvelle Banque de l'Union v. Ayton.

This was an action brought on a promissory note for 8,800*fr.* by the holders (endorsees from one Fiske Fay), a bank in Brussels against the defendant as maker.

Mr. Reid, Q. C., and Mr. F. Abrahams appeared for the plaintiffs; Mr. Bucknill, Q. C., and Mr. C. Gregson Ellis for the defendant.

Mr. Bucknill admitted the making of the note by the defendant, but said he had been grossly swindled by Fiske Fay, who was now dead, under the following circumstances. The defendant was a dentist, and when 23 years of age went, in 1882, to Brussels. There he became assistant to a dentist called Fiske Fay, who told the defendant his business was worth £4,000 a year, and eventually an agreement of January 26, 1884, was come to between them, whereby the defendant bound himself to Fay for 15 years at a salary, and with certain penalties if the defendant should break it, and if nothing was done during the 15 years or at Fay's death the defendant was to pay £7,000 in cash for the business. The defendant without consulting a lawyer, was induced by Fay to enter into this agreement by his fraudulent statements. It was written in French, which at that time the defendant understood very imperfectly. At the time of signing the agreement Fay produced 20 promissory notes for the defendant to sign, saying

it was a mere formality in accordance with the agreement and that they would not be put in circulation. The defendant signed the notes and continued for about four years with Fay but finding the amount of the business had been grossly exaggerated, and in consequence of disagreements and to get out of Fay's clutches, he left Brussels in 1887. Fay died in 1889, having deposited one of the promissory notes—that now sued on—with the plaintiff, bank. The terms of the promissory note, translated, were as follows :—"Six months after the date of the decease of M. Fiske Fay I promise to pay to his order or the bearer the sum of 8,880f. 25c., value in account according to the agreement of this day." Counsel contended (supported by the evidence of M. Adolphe Jones, but contradicted by M. Kirkpatrick, both advocates practising in Brussels) that by the Belgian law, a note bearing on its face a reference to an agreement is transferred with all its equities, and that a *bona-fide* holder for value was in no better position than Fiske Fay or his executors.

Mr. REID submitted that the plaintiffs were *bona-fide* holders for value and not affected with fraud (if any) of Fiske Fay.

Evidence having been called on both sides.

Mr. Justice Wright summed up the case to the jury. It was very important that if a man, however foolishly, put his signature to a promissory note he ought to be liable to satisfy it in the hands of a *bonafide* holder for value, though he would have his remedy against the person who committed a fraud. By the law of England this was a promissory note and a negotiable instrument ("Jury v Barker," 27 D. J., Q.B., 255). The defendant said the law of Belgium was different; but a party who relies on a foreign law must bring that clearly before the Court, and if not, the question must be decided by the law of England ("Lloyd v. Guibert," L. R. 1, Q.B., 115).

The jury then said they were not satisfied that Belgian law was different from English law on the point in question.

In answer to further questions, they found there was such conduct on Fay's part as would disable him from negotiating the bill; that the bill ought never to have been discounted and that the contract was rescinded after the note was handed to the bank, and before Fay's death.

On these findings judgment was given for £359 19s. 6d., but execution stayed for a week, and if notice of appeal was given within that time, until the hearing of the appeal.

DEATH THROUGH SWALLOWING A FALSE TOOTH.

Mr. Weekes (deputy coroner) held an inquest at Moor Street, Birmingham, on the 3rd inst., upon the body of Fanny Barrett, aged twenty-eight, whose parents live at 3 Court, Vauxhall Road.—Deceased was employed as a domestic servant at the Anchor Tavern, Lawley Street, and on the 4th of August, whilst taking a drink of water, swallowed a false tooth. She told her mistress, who advised her to go to the General Hospital, and accordingly she and her mother went to that institution. She was subsequently seen, however, by Dr. Darlington, who examined her, and came to the conclusion that the tooth and plate were lodged in the œsophagus. He communicated with Dr. Jolly, and deceased was once more taken into the hospital. Her symptoms were very obscure, and it was impossible to determine whether the tooth was really lodged in her body at all, it being thought that she might be suffering some disease of the stomach. The symptoms, in fact, were so doubtful that the doctors did not feel warranted in performing a dangerous operation. She was allowed to leave the institution, and although she complained at times of pains in her back and side, she was soon able to resume her duties as a servant, and apparently enjoyed good health.

On Friday morning, however, she was suddenly taken ill, and vomited a large quantity of blood. Dr. Darlington was called in, but death occurred the same day from syncope. A post-mortem examination was made by the doctor, who found the tooth and plate situated at the bottom of the œsophagus, near the entrance to the stomach. The plate, which was formed of vulcanite, had perforated the walls of the œsophagus with the result that the one end had injured the lung substance and the other had penetrated the aorta, causing the hæmorrhage previously spoken of.—In answer to questions from the Deputy Coroner, Dr. Darlington stated that the plate of the tooth was smaller than was usually the case, and therefore the suction power would be rather defective. He also remarked that it was an extremely rare occurrence for a tooth to get loose in waking hours.—The mother was recalled, and stated that the deceased had had the tooth five years and that she bought it from a dentist in Corporation Street for 7s. 6d.—The Deputy Coroner, in summing up, said that it was a warn-

ing to people not to buy cheap false teeth, and he suggested that their verdict should have reference to cheap dentistry. —The jury returned a verdict of "Accidental death," but refused to add a rider, a course which led the Deputy Coroner to remark "Perhaps there are some dentists among you, gentlemen."

We see by our advertising columns that the Royal College of Surgeons in Ireland will hold a Supplemental Examination for the Dental Diploma under their revised regulations on March 15th.

VACANCIES.

National Dental Hospital, 149 Great Portland Street, W.—The Post of House Surgeon will become vacant March 14th, Candidates must possess the L.D.S. Diploma. Applications with testimonials to the Secretary.

The Dental Hospital of London, Leicester Square, W. — The post of four Demonstrators Fillings is vacant. Applications accompanied by testimonials to be sent to the Dean on or before March 16th, 1891.

Dental Hospital Reports..

MONTHLY STATEMENT of operations during January, 1891.

	L ondon.	Manchester.
Patients . . . . .	.	842
Extractions	1299	561
„ under Anæsthetics	792	85
Gold Fillings	385	28
Other Fillings	1077	193
Irregularities	17	—
Miscellaneous	169	309
Artificial Crowns	16	—
Total	—	666
<i>House</i>	H. B. BOWTILL,	
<i>Surgeons</i>	W. MAY,	A.H.DERWENT
	W. S. HOLFORD.	

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DENTAL EDUCATION.*

By R. DENISON PEDLEY, L.D.S., M.R.C.S. Eng. F.R.C.S.Ed.
Dental Surgeon to the Evelina Hospital for Sick
Children, Southwark.

GENTLEMEN,—I value the privilege you have conferred upon me, and as your President, I desire to offer a few remarks this evening in a general way on Dental Education. It is almost superfluous for me to point out the great usefulness to the Students of such a Society as ours. Here we have a miniature Dental Association, where subjects which interest us most may be constantly discussed. Where every Student is encouraged to bring forward some idea or record of a case which may be of value to his fellows. It is a training of much benefit, enabling a man to express clearly and concisely his opinions, and all should take a part, however little that may be. The feeling of hesitation, which comes to most of us, when first standing before our associates, soon passes away, and through this experience, a man is enabled to stand before a more critical audience, when he joins the Dental Societies as a Practitioner. Believe me, there are many, who regret the absence of this early training.

Before we endeavour to gauge the present position of the profession we have adopted, it is advisable that we should briefly look back upon the past, for only by so doing can we learn to appreciate the advantages we now enjoy, and take hope for the future.

The history of Dental reform is, in itself, an absorbing and an interesting study. I question, whether in any profession, or branch of a profession, there has been made such progress as in our own, during the last 40 years.

* Inaugural address to the Students Society of the National Dental Hospital.

Thirty-five years ago, the Dentists of this country, were a disorganised body of men. There was not a Dental Hospital in the United Kingdom. A Dental Diploma was not in existence. There were neither Dental Associations nor journals. The changes which have taken place since then are due to an earnest body of Dental Practitioners, to whom we owe a lasting debt of gratitude for their noble sacrifice of energy and time. Many have passed away : but I am happy to say, we have some yet with us, who have lived to enjoy the fruits of their labours in the good cause.

At the present time, we have 12 Dental Hospitals in the United Kingdom. In connection with each of these, we have a number of gentlemen who devote much time to teaching the results of their own experience. Most of them do this as a labour of love. The pecuniary benefits are practically nothing. In connexion with each of our Colleges of Surgeons, we have a special Diploma. There are several excellent Journals governed by no party prejudice. Our Dental Associations are to be found all over the country, and our English text books are unequalled.

The necessary training a man must undergo in order to obtain his qualification here in Dental Surgery, is prolonged over five years of work. Three years of that time must be devoted to work in the Dental Laboratory. This is one of the most essential parts of our education. I take it as one of the most encouraging signs of Dental progress of late, that such work is now put to the test at the Examination. I fear there is a tendency for students, to direct their attention to other qualifications at the expense of mechanical work. I would not attempt to discourage any man from taking degrees outside his dental work : but three or four years devoted to honest labour in the Dental Laboratory, is of far more value to a dentist, than any amount of medical work outside that required to complete his dental curriculum. Other qualifications should *follow* laboratory work, not *precede* it. It has been the fashion, and is now with some, to depreciate laboratory work, on the grounds, that it unfits a man for that manipulative dexterity required in the operating room. Such statements are as absurd as they are groundless. Every man who practises in our special branch of the medical profession, (whatever else he may be) should be a skilled mechanic. There is no better training for the operating room, than that of the Dental Laboratory. One is simply a continuation of the other.

Does anyone doubt the manipulative dexterity of a man, who can make a complete upper, with or without gum blocks, or imagine that he, who can make a partial upper in metal, fit the bands, and let down the teeth to the bite, is lacking in the requisite skill, required for the mechanical operation of filling a tooth with gold, or fitting a crown to a healthy root? I speak from some experience in these matters. Four years I worked at the bench ; and every-day of my life I am thankful for the experience.

There are other ways of looking at this subject. Great as are, and will be, the advances made in endeavouring to save teeth, evidence is not wanting, that there will always be a large number of our patients, who require artificial substitutes. If you do not carry out this work yourselves, or have it done under your own supervision, there are plenty of unprofessional men who will. A vast sum of money is yearly taken by such men, who by their specious advertisements, allure the unsuspecting public into their clutches. You know what the character of such work is. You know it is bad, and we must look to our own laboratories, and see that our work is good, and worthy of ourselves. By so doing we have one means of cutting the ground from beneath the feet of those who seek to make a trade of our profession.

Two years of the Student's time must be devoted to Hospital work. It is none too much when we take into consideration the subjects which are placed before him. There are many lectures to attend, and his time is well divided between the Dental and the General Hospitals. It is unnecessary for me to go into any detail with regard to these matters. There is one suggestion that I would offer while attending the General Hospital. Take every opportunity you can of attending the out-patient department. You will see much, and learn much that will be useful to you when in practice.

There is one great difficulty the Student has to meet in our hospital. He will find much diversity of opinion, as regards methods of treatment. At first it is difficult to understand ; but looked at in its proper light, there is great advantage, for a man's views are confined to no narrow limit, and experience will teach him, that there are many ways of accomplishing the same end.

Taking the L.D.S. diploma as it stands, though I believe in the future it will be found possible to improve it, there is no better Dental Qualification to be found than ours, in the

wide world. In times gone by our examining boards tried to insist upon the necessity of taking a Surgeon's diploma in order to practise as Dentists. Had that become a law it would simply have stopped that necessary Laboratory work of which I have already spoken.

Our American brethren were well in the field long before us in Dental Reform.

We owe them a debt of gratitude, for the hospitals they established, and the teaching they insisted upon, stimulated our earnest reformers in bringing about the results we have to-day. Now, we have fairly beaten them in the race. Where is there to be found in America an examining body who insists upon a preliminary examination, such as we have, and five years training in laboratory and hospital work before granting its dental diploma?

In most of the American universities, the degree of D.D.S. or D.M.D. is granted after a preliminary examination of the simplest kind and two or three years Dental training.

From the prospectus of the Havard University session 1890-91, "Attention is called to the fact that eighteen months of progressive instructions compose the required two years in the school." From that of the Pennsylvania College of Dental Surgery, "by an arrangement with Jefferson Medical College such students as may desire to do so can, if found qualified, obtain *the two degrees in Dentistry and Medicine in three years.*" In the "*Dental Record*" of this month are to be found gleanings from the proceedings of the American Dental Association of last year. In the discussion of the subjects, Dental Legislation and Education, the following letter was read from Dr. Hugen Schmidt, of Paris. "I am very glad to see that an American citizen and a member of our profession, should have indicated that it is time to call a halt to the manufacture of D.D.S's by the cart load, as is done by certain colleges in the United States without sufficient consideration of the baggage of scientific knowledge possessed by those who are armed with this degree. The American diplomas of D.D.S. had attached to them a well-deserved reputation throughout Europe, until within the past few years, when it was observed that those who went to the United States, for the purpose of acquiring an American degree, could return to their respective countries after attending a course of a few months at one of your second-class colleges, bringing back with them an amount of knowledge much inferior to what had

always been expected from one who possessed an American dental degree."

These statements speak for themselves. Much as we owe to our American friends for the numerous devices and improvements in mechanical appliances, they have much to learn from us in the training of students, both Dental and Medical. Many of them to-day, are desirous of, once and for all, putting an end to a system, whereby men are turned out wholesale, with lofty titles and scanty training, in order to put money into the pockets of teachers and examiners.

When the student has passed through his hospital career, there is much more to learn, and if I may offer a practical suggestion, I would earnestly advise every qualified man to assist a practitioner, before settling down and starting for himself. With an older practitioner, he will find out many new ideas and methods, invaluable to him in after life.

In order to practice as Dentists, there are other qualifications absolutely necessary, besides those we can write after our names. These our patients must record, if we are to be successful. That we should be *considerate kind* and *gentle* are qualities well recognized outside, but not too often mentioned here.

The most satisfactory conditions of our speciality are the certain and definite results, which can be accomplished for the majority of our patients. There is one drawback. We may be so firmly convinced of what ought to be done, and what we can do, that the feelings of a patient are apt to receive little consideration. Let me illustrate this by a small incident which came under my notice here. A good operator was excavating a cavity for a gold filling, the patient was very nervous, and probably the dentine, was somewhat sensitive. "If you don't sit still, I won't stop your tooth at all," said the operator. The patient sat still, and the tooth was filled: but the patient knew that the operator was not *considerate*.

There is no branch of the medical profession where so much pain is necessarily inflicted as in ours. It is our duty to use every legitimate means we can to alleviate such pain. This is so well understood that all sorts of drugs and materials are used, and constantly lauded for the purpose, but out of them all, there are none to be compared to a kindly word, and a *gentle* hand.

ALVEOLAR ABSCESS : ROOT FILLING.*

By Mr. P. R. SIBSON.

Mr. President and Gentlemen,—I confess that it is with no small amount of trepidation that I essay to introduce to your notice this evening a paper bearing such a commonplace title as the above, for there is, perhaps, no individual subject which has received more attention from members of the dental profession than this.

But, gentlemen, I will make no apology for adding another paper to the number already in existence, because, every day's experience sufficiently demonstrates the fact that a considerable proportion of the cases, which are presented to us for treatment, involve a dead tooth, with or without an alveolar abscess; and therefore, I submit that it is a subject well worthy of the consideration of every member of our society. No one will deny that a large percentage of the teeth, which are continually being sacrificed, could undoubtedly be preserved and rendered useful for an indefinite period. As students, we have not the time, nor are we perhaps sufficiently enthusiastic to undertake the conservation of more than a limited number of pulpless teeth in hospital practice, but it would be ruinous folly to emulate the policy of that notorious forcers knight Sequah in conducting private practice.

When the general public, not to mention the allied medical profession, are similarly alive to the value of the natural teeth as regards the mastication and digestive functions of the human body, they will cease to have a sort of vague undefinable horror of the dental surgeon, and instead of waiting until their masticatory organs have generated into a hopeless condition, will consult him as soon as a slight pain or a fissure in the enamel manifests itself.

Now, sir, what is an alveolar abscess? An alveolar abscess is defined by Harris as a collection of pus formed in the socket of a tooth at the extremity of the fang which generally escapes through the gum. The popular designation of this affection is gumboil, but this conveys a wrong impression, inasmuch as the gums are only secondarily affected, while the seat of the disease is always within the alveoli.

* A paper read at the Students' Society, Victoria Dental Hospital Manchester.

Hence the more appropriate name of alveolar abscess has been conferred upon it."

It is not my intention to review the history of the tooth from the first invasion of decay to the culminating point when the pulp is reached by the restless little bacteria specially concerned in this irritating morbid process, but from this moment, I will briefly endeavour to trace onwards to the formation of the abscess.

As an immediate result of the exposure of the pulp, inflammation is produced. The pulp may part with its vitality by slow degrees, or acute inflammation may be induced, which latter will be treated of presently. From the time when the chemical ferments, generated in the cavity, first had access to the pulp a dull gnawing pain is experienced, and an effusion of pus takes place as the inflammatory action invades more and more the healthy portion of the pulp. If the exposure be large, this pus may cause little inconvenience by draining into the cavity, and thence into the mouth; but if on the other hand the opening be blocked with debris (disorganized dentine or particles of food,) it will eventually find its way through the apical foramen, and produce a morbid condition of the pericementum resulting in inflammation.

At this stage the tooth feels to be raised in its socket and exhibits a dull wearing pain, momentarily relieved by pressure, owing to the lessening of the tension by the exuded material being driven into the surrounding tissues. Examined microscopically the vessels appear engorged to three times their normal size. In that condition of the pulp, which I have endeavoured to describe, and which is known as the "chronic variety, the pulp is first attacked merely in the portion immediately in apposition to the exposure. From this position, it gradually spreads, leaving behind it a track of pulp tissue, rapidly sloughing and degenerating into pus. Thus it often happens, that while the contents of the canal in one of the roots of a molar (for example) may be in a suppurating condition, another root in the same tooth may present vessels whose vital energy is but little impaired. It affords an instructing instance of the opposition which the healthy tissues invariably exhibit towards any pathological process taking place within them.

Before passing on to the acute variety of inflammation, I may mention that a pulp is occasionally found in a dried up condition, which may be ascribed either to the exclusion of

the atmosphere or what is more probable, the removal of the moisture, being somewhat analagous to the absorption of the serum of ordinary pus, resulting in the spontaneous natural cure of abscesses in other parts of the system.

An acute abscess is the sequence of active inflammation, and usually takes from three to four days to complete its course. As the pus discharges itself at the apex of the fang, the tissue is gradually removed to give place to it, and the fluid rapidly burrows its way out, usually in the direction offering the least resistance. Until it has penetrated the bone of the alveolus, the pain is most severe, and in cases which present a dense fibrous gum remains scarcely less so. When the discharge has been evacuated, the opening may heal at once, but in many cases it fails to do so, pus continues to form, and a permanent canal is established,—the inflammation assuming a chronic form. Instead of following this course, the exuded matter may become diffused, and the parts assume a boggy appearance,—a condition of things occasionally resulting in necrosis of a portion of the bone; or by its discharge into the antrum or nares a dangerous and troublesome pathological condition may be induced. A very distressing resultant is the appearance of an abscess on the surface of the face, most frequently from the 3rd lower molar. This may be due either to the prolonged retention of a suppurating tooth, or to the application of some poultice, or counter-irritant, superficially with the design of removing the pain.

But the abscess generally points on the buccal or labial aspect opposite the offending fang. In a clinic delivered at St. George's Hospital, London, the lecturer pointed out that any sinus above a line drawn from the lobe of the ear to the angle of the mouth may be due to an upper, while one below that line may be ascribed to a lower tooth.

Pus consists of serum holding in suspension numbers of leucocytes and disintegrated tissues. It contains fat, albumen and animal matters. The pus corpuscles are seen under the microscope as opaque spherical globules, consisting of cell membrane containing nuclei, oil, and minute granules. Cells are found in a state of fatty degeneration, now called exudation corpuscles. It has now been proved that it is impossible for pus to form apart from the presence of micro-organisms.

I now come to the treatment of alveolar abscess and dead teeth with a view to subsequent root filling. Before doing so, I will briefly refer to the method of destroying an exposed

pulp by means of arsenious acid. The extirpation of the pulp ought to be undertaken if there be the slightest lesion present. I believe that to be the safest and wisest course to pursue, although some practitioners go so far as to insist on the retention of even small portions of pulp, an unwarrantable proceeding invariably attended by bad results.

Arsenic should not be used in temporary teeth, nor should it be used in permanent teeth if there is reason to suspect that the fang is not fully developed. What I wish to emphasize is the necessity of employing great care in its application. The cavity should be closed and moisture excluded; if the orifice of exposure is small, it is best to enlarge it, in order to render the action of the drug more certain and to alleviate pain arising from an enlarged pulp pressing upon the sharp edges of dentine.

In applying the drug to an exposed nerve situated in a proximal cavity, I have followed the plan (suggested to me by a practitioner) of placing a wisp of wool or some other protective material, upon the gum, between the cavity and the contiguous tooth, thus obviating any danger of leakage followed by shrinking of the tissue. This precaution, of course, is unnecessary if the rubber dam is *in situ*. An exceedingly small quantity of Arsenic should be applied, Sir J. Tomes recommending one-sixteenth of a grain. The cavity should then be sealed with Zinc Oxysulphate, and left for a period varying from 24 hours to a few days. In order to illustrate my reason for advocating the use of Osteos to the exclusion of such temporary plugs as mastic or copal ether, I will relate an incident recently brought before our notice.

On Oct. 31st of this year, a female patient presented herself at the Hospital with an exposed pulp to which arsenic was applied and properly sealed in by means of mastic. On Nov. 21st, she again presented herself minus the temporary plug. On examination, the tissues surrounding the tooth were discovered to be in a terribly congested and inflamed state. Enquiries elicited the information—that having felt pain on the second day after its insertion she removed the dressing, the drug thus being brought into direct contact with the gum.

The treatment of roots preparatory to filling:—

The sound surgical maxim in the treatment of analagous

cases is, remove the cause. Therefore the removal of that condition productive of the alveolar abscess is indicated.

To effect this the constitutional treatment is perhaps by no means unimportant. Improve the tone of the system generally. It may be well to resort to a purgative, as is frequently done in cases of abscess formation. The dead pulp may often be extracted *en masse* by the application of a drop of tincture of myrrh. Sir John and Mr. C. S. Tomes recommend tannic acid for this purpose, but the previous drug is quite as efficacious, if not more so. Great care is necessary to prevent any portion of the pulp or septic matter from being pushed through the apical foramen, in order to obviate which, all pumping actions must be rigorously avoided.

Should there be a sinus leading from the apex to the labial or buccal surface, this rule may be disregarded after the removal of as much septic matter as possible from the root ; for in these cases it is a good plan to pump hydrogen peroxide right through from the cavity to the surface of the gum. When the canals have been rendered aseptic by this thorough treatment, the sinus will usually heal. If it does not, it may be stimulated by a weak solution of carbolic acid applied in the same manner.

Supposing that there is an abscess, say at the apex, which has no external communication, the advisability of drilling through the alveolus, may be considered. An artificial sinus is thus produced and the succeeding treatment is identical with that observed above. But a large majority of the cases with which we are familiar, fortunately do not require such treatment. It is to these cases that the immediate method may be applied. The rubber dam is applied and the cavity leading to the pulp chamber is sufficiently enlarged to allow of the free use of a Donaldson's bristle in the root or roots, if there are more than one.

There is no necessity to enlarge the root canals, although it is admissible in the constricted canal of a bicuspid.

The conditions essential to the successful accomplishment of the immediate method and the different steps followed are:—

- 1.—Thorough dryness. (This may be obtained by means of heated air, all superfluous moisture having previously been removed by some absorbing substance).

- 2.—Complete excavation.

3.—Disinfection (the most reliable medicament at this stage is carbolic acid repeatedly applied on wool).

4.—The cavity should again be dried and saturated with chloroform.

5.—Bichloride of Mercury may now be continuously introduced.

6.—The tooth must again be dried and an ethereal solution of Iodoform applied, or Iodoform, finely powdered, may be projected into the cavity by means of the chip syringe.

If all the stages briefly summarized have been sedulously observed, the roots may be considered ready for filling.

It is impossible, however, to lay down any absolute course to be followed in the disinfection of root canals. As in many other operations, great care is to be used in determining the method of treatment to be adopted. Some drugs are unsuitable in certain cases, and others may have a deleterious effect on the filling material to be afterwards employed. It has been pointed out that strict cleanliness, observed in performing every detail, is of as much importance as the strongest germicide.

The root having been made aseptic, the question arises as to what filling to employ. Whatever be selected, it must present the qualifications of being non-irritant, insoluble, capable of closing hermetically the apical foramen, and completely occupying the whole of the interior of the canal.

Those of us who had the privilege of hearing Mr. Matheson on "The Treatment of Dead Teeth" some weeks ago, could scarcely fail to be impressed with the advantages possessed by wood points. But to my mind wool imbued with Zinc Oxyphosphate carefully introduced forms an admirable filling.

Mr. Campion, in one of his lectures on Dental Surgery mentioned Copal Ether on wool, as very good; the great difficulty being that it adheres to the instrument in introduction. Shellac certainly forms a very solid and serviceable root plug, whilst a solution of chloroform and gutta-percha has many adherents.

But as I have before mentioned, I fail to see that we can really improve upon Oxyphosphate of Zinc. It is easy in its application, non-irritant, may be carried right up to the foramen, can be introduced into the merest filament of a canal, and fills solidly the whole space.

But, after all, the question of material is best left to the individual judgment of each operator.

A failure may result from not having thoroughly disinfected the tooth, or from the apical foramen not being securely sealed. In many cases, too the patient having become slightly indisposed, trouble may be set up in a tooth which previous to filling was in very bad condition, or want of cleanliness on the part of the patient may be the exciting cause. A capsicum plaster applied on the gum over the offending part is generally all that is necessary to effect its restoration to a healthy condition.

If this should fail, a leech may be applied. No beneficial result being obtained, it is necessary to remove the filling, re-open the canals and repeat the whole process of disinfection with greater precautions, if possible. I had in myself a left lower second molar which was devitalized and filled at the age of fourteen. It remained perfectly satisfactory for three years, when it gave slight uneasiness for the first time after the operation. This uneasiness, so slight as to be only just noticeable, recurred at regular intervals afterwards, attended by formation of a trace of pus. The tooth was eventually removed six months since, to give place to an erupting 3rd molar tooth. It has occurred to me that a similar experience may befall at any rate some of our patients—too slight to prompt their return—so that it is difficult to say in what per centage a perfectly satisfactory result is obtained. My experience hardly justifies me in saying that the immediate method may always be employed, but I am firmly convinced that the time is fast approaching when it will be unheard of to occupy more than one sitting for the complete treatment of a dead tooth. We live in a busy, bustling practical age, and people, especially those who are in business, do not regard a single tooth of sufficient importance to necessitate frequent visits to the Dental Surgeon. There is another consideration, and that is, the time of the professional man who for each visit of his patient is justified in charging a fee. These two factors are probably in no small degree accountable for the number of teeth extracted, which might be saved. Thus, gentlemen, it follows that any method having for its object the swift, but conscientious accomplishment of any of the operations, which the profession is called upon to perform, will have the earnest attention of the wise and progressive dental surgeon ; for he

who is able to operate with thoroughness and despatch is bound to secure for himself a large share of the public patronage and support.

In my paper, this evening, I have only endeavoured to deal with that alveolar abscess, which is a sequence of a suppurative pulp, ensuing from the ravages of decay. A paper such as this is totally inadequate to consider forms arising from diseases of a constitutional nature, which would furnish a sufficient subject for a future paper. In those cases any pulpless teeth are absolutely unfit for root filling, and, if they are giving trouble or keeping up a condition of irritation, should be promptly extracted.

ENAMEL MARGINS.—The object sought in making fillings is, first to shut out corrosive agents perfectly; and second, to leave the least possible harbour for débris to undergo fermentation and the formation of corrosive agent to re-attack the enamel. To do this, we must so form the enamel margins that they shall present the strongest edge possible against which to adapt the filling-material. In forming these, consideration must also be had for the strength of the margin of the filling-material, which must not be too much thinned away. If the enamel were equally strong in all directions, and no more friable than the filling-material, a square edge would make, would be good. But on account of the cleavage of the enamel that form would be unsafe. Such a cut is difficult to make and leave a perfect edge, because of the liability to displacement of some of the short ends of rods from the immediate margin. If accomplished, it would be difficult to condense the filling-material against it without a like displacement. If, however, the enamel is cut so as to slope upwards and slightly outwards, the immediate margin will be composed of the ends of rods which have their full length, and with their inner ends resting upon firm dentine. In this we find the strongest form of enamel is concerned; and on most parts of the crowns of the teeth the edge of the filling-material will have good strength and be fairly easy of adaptation.

Dr. G. V. BLACK, in *Cosmos*.

British Journal of Dental Science.

LONDON, MARCH 2nd, 1891.

SWALLOWING ARTIFICIAL DENTURES.

THE death of Fanny Barrett from hæmorrhage, consequent on ulceration into the aorta owing to the pressure of an artificial denture, which had lodged in the œsophagus, will bring very forcibly home to many a possible danger that may follow on the wearing of artificial teeth. Quite a number of cases could be collected from current journalistic literature of the swallowing of artificial dentures. We are happy to say that many of these accidents have been without fatal results. There was Dr. Leddlie's case, in which a denture armed with sharp wires, sailed safely down the alimentary canal and out of the body per anum. This, however, must be viewed as exceptional, for when one considers the many sharp points usually present in a denture of the size likely to be swallowed, it must be apparent that the chances are very much in favour of its hitching somewhere in the alimentary tract. Now, it is not our purpose to raise unnecessary alarm, nor to make a mountain out of a mole-hill. Carefully made and properly adjusted artificial dentures may be said to be absolutely safe, provided the patient takes them out at night. This proviso we would urge on all grounds. It is perfectly true that many dentures, especially the larger ones, can be worn almost as safely during the night as during the day. But an accident may happen. We are sure that anyone, having had practical experience, will bear us out when we say, that it is astonishing why some of the mishaps to plates do occur. Plates that

seem so strong, yet do break. We hold, therefore, that it is absolutely impossible to give any guarantee against such accidents happening. If, however, we put our plea against wearing artificial plates at night, on the simple arguments of cleanliness, we are, if anything, on stronger ground. It is difficult to conceive how people can have such elementary ideas on this matter as to be guilty of the practice of wearing dentures almost continuously; it seems to us so against the most elementary laws of cleanliness, that, we feel, words must almost be wasted arguing so apparent a matter.

But it is not these newly-made, well-fitting and strong plates, which are liable to accidents of this kind. It is the worn out, ill-fitting, patched-up plates which are as a rule the cause of all the mischief, the cause, every now and again, of the death of the wearer. We believe it is the duty of every Dental Surgeon to take up a very strong position in regard to this matter. He must, if need be, run the risk of seeming to be anxious to obtain work, because he knows full well the dangers which his patient is liable to by wearing such plates, because it is his duty to point this out to his patient, and to advise new substitutes. We would the more urge this, as in very many instances, it is not a question of the patient being unable to afford the expense, but rather that, having become accustomed to the old plates, they shrink from enduring the period of discomfort, through which most have to pass when new plates have been inserted. As a rule the patient does not realize how ill-fitting is the old plate, how weak it has probably become through the additions and repairs it may have undergone, nor has the risk of his swallowing the plate probably crossed his mind. There ought, and we sincerely trust there is, sufficient *esprit de corps* among Dental Surgeons, sufficient professional feeling, to lift men above doing shady actions for the sake of gaining a stray patient. For example, saying that a plate can be repaired when the patient comes with the tale that some other practitioner has said, that it cannot. Each man should, of course, use his own judgment, but certainly if a man takes upon himself to repair a plate, which another has condemned, he also takes upon

himself the responsibility for any accident which may hereafter follow.

There is also another point which suggests itself to us in connection with this subject, and that is, what is the proper size to make a plate? Other things being equal, the larger the plate the less chance there is of its ever passing either into the larynx or the œsophagus. It would be absurd to say that any hard and fast rule could be stated; but, most certainly, there is a not unnatural tendency to make the plate as small as possible, being often urged thereto by the requests of the patients themselves. Leaving for the present the question of large suction plates versus small ones retained by means of clasps, it is, we claim, necessary that one should resist this tendency to reduce the plate in size until it has been demonstrated that it is absolutely needed. It is within the experience of all that a patient will usually as readily accustom themselves to a large plate as to a small, whilst, it should be remembered, that the plea of interference with taste must be purely imaginary, for the mucous membrane covering the hard palate is absolutely devoid of organs adapted to the appreciation of differences in taste. Finally, we would urge that each man when making a plate should remember that these fatal accidents are especially liable to occur after a plate has been fractured, that he should bear in mind the points which require specially to be strengthened, and should allow no petty economy to prevent him guarding his patient's life and his own reputation by taking all these preventative measures which his skill and experience dictate.

WITH the current issue the *Vierteljahresschrift für Zahnheilkunde* has commenced the publication of a Bibliography of all the works, both of a medical and scientific nature, which have bearing on Dental matters. It has been compiled by Dr. Alfred Sternfeld and Carl Kellner. The special feature of this Bibliography is to be its alphabetical arrangement, thus distinguishing it from Crowley's, which is on a chronological basis and is subdivided for different languages.

It is not contemplated to give a special index for the matter appearing in the current journals of the whole world, especially as Taft has already issued such an one for those in the English language, whilst M. David has already promised one in the French. It is, therefore, the intention to issue a similar index for the German Journals, as a supplement to the present Bibliography, so that with the two above mentioned indices, the series will be complete. Julius Weiss undertakes this supplement. It is expected that this Bibliography will be complete in a year and a half to two years, but it can be had separately. Its size is from three to four hundred pages.

THE duties of Journals, Newspapers, &c., are certainly manifold. The *Period* has lately been investigating the claims of the Kensington Ladies' Dental Institution in consequence of a letter from a Mrs. S—. It informs its readers that the nominal proprietor "Mr. H. F. Partridge left eight years ago. Three days in the week are set aside for ladies with limited income, but only two assistants attend." Certainly it is worth buying a *Period*, if in response to a letter it will undertake to investigate the merits or demerits of such institutions.


A curious case occurred the other day at the Worship Street Police Court, when Alfred Ward, twenty-one, a fish-monger, of Broad Street, Ratcliff-highway, was charged on remand with "unlawful possession." On the afternoon of the 9th inst. the prisoner presented himself to Mr. Edward Taylor, dentist, of Huntingdon Street, Bethnal Green, and said he had some superfluous teeth. The dentist was about to invite him to his surgery preliminary to relieving him of a decayed molar, when the prisoner produced the teeth from his coat pocket. They were a set of artificial teeth. The prisoner said he had enough natural ones, so wanted to sell those he put on the table. Questioned as to where he

got them, he made some hesitating and contradictory replies. Mr. Taylor called in a passing constable. The prisoner was locked up. It now appeared that only a few days before a lady had given information to the police that while walking along Commercial Street, on the way to her dentist, carrying her teeth in her hand-bag, she was hustled by three men, one of whom dragged her bag away and ran off with it. The lady now appeared in the witness-box, and as her teeth were on the ledge in front of her, her articulation was so indistinct that her evidence scarcely reached the reporters' box. She did not, however, identify the prisoner as one of her assailants, and the magistrate sentenced the man to a month's hard labour for unlawful possession.

Amongst the rarities, says the *British Medical*, now in the hands of Mr. Quaritch, the well known bibliophile bookseller of Piccadilly, is one of special interest to students of old surgical literature—it is : “ *La maniere de traicter les playes faictes tat par haquebutes que par fleches : et les accidents d'icelles, come fractures et caries des os, gangrene et mortification : avec les pourtraictz des instrumentz necessaires pour leur curation, et la methode de curer les combustions principalement faictes par la poudre a canon.* Le tout coposé par Ambroise Paré, maistre barbier chirurgien à Paris. 1551.” In the ordinary state this edition of Ambroise Paré is very scarce, but the copy now for sale is unique ; it is printed on vellum, and was the presentation copy to Diane de Poitiers, whose monogram, together with that of Henry II, is painted on the title page. Brunet mentions a 1545 edition of Paré, but does not refer to any copy of that date, nor has one come to light since his time ; it is therefore probable that this is the first edition. The initial letters and the woodcuts of instruments are all illuminated, and the book is in the original calf binding as presented to Diane de Poitiers.

Abstracts of British & Foreign Journals.

THE GERMAN DENTAL JOURNALS.

In the *Vierteljahrsschrift für Zahnheilkunde*. January 1891. Dr. WILHELM VAJNA, of Klausenburg, describes some forceps of a new pattern, which he has designed to meet those cases in which either the crown of the tooth has decayed away right up to the neck, or in which the crown has broken away, leaving the root behind above the alveolar margin. The blades of these forceps are so shaped that a transverse section of each represents a T, the two cross bars of the T of the two blades coming in apposition, so . The margins are sharpened. For upper teeth the shanks and handles are bent to resemble an ordinary bayonet forceps, whilst for the lower they are the ordinary right angle hawk's bill. Dr. Vajna specially intends these for teeth anterior to the molars, but they can be used for the roots of the latter teeth when these have been divided. Dr. Vajna has constructed the forceps to take the place of the elevator, and to obviate removal of the alveolus. He claims that, as against the elevator, they require less skill, and consequently are safer in the hands of those not practised in the use of the elevator; when compared with operations requiring resection of the alveolus, they do not leave such a big wound with the consequent pain, hæmorrhage, suppuration and possible deformity of the alveolar margin of the jaw. The idea of these forceps is to produce an incised wound instead of an irregular fracture of the alveolus with a ragged tear of the gum. No attempts at rotation should be made but a lateral motion given to the forceps.

Dr. J. Von METNITZ, Professor in the University of Vienna, describes an Odontome which he found connected with the root of a right upper incisor tooth. The occurrence of an odontome in the incisor region he believes to be unique. The patient in which this occurred, was about forty years of age and had suffered no trouble, indeed was unconscious of its presence, neither Dr. Von Metnitz nor the patient detected the odontome, before extracting the root, there being nothing abnormal about the shape of the bones. The root was extracted preparatory to inserting artificial teeth, and was

somewhat buried in the gum, and difficult to remove. The mass was about the size of a wild cherry. The surface was covered by pieces of periosteum which required some force to remove, leaving behind an uneven but smooth and polished surface. Almost the whole length of the root was intimately connected with the malformation. Sections showed that this union was due to an overgrowth of cement, which half enveloped the root, on the one side of the growth being continuous with the cement of the root ; on the other, being separated from it by a deep fissure. The cement could be traced over the surface of the mass for some little distance, it then came to an abrupt termination, the margin appearing as if it had been broken off, but distinctly overlapping a layer of enamel which covered the remaining portion of the surface of the growth. The body of the mass was formed of dentine, in which the remains of pulp cavities were distinctly visible, from these the dentinal tubules radiated outwards. The prisms of the enamel were well formed. In two or three places the enamel layer appeared to dip into the underlying dentine, forming, especially in one place, irregular wavy layers, which contained newly developed bone substance, as was apparent under a high power. The processes of the adjacent bone corpuscles did not communicate, but were separated by irregular cavities and fissures. Von Metnitz regards this abnormality as being developed from a supernumerary tooth-germ, which had grown round, and become united with, the neighbouring root. He regards it as analogous to the odontome figured in Wedl & Heider's atlas, which was developed from a supernumerary tooth-germ that had enveloped and become connected with a lower wisdom tooth. The one here described differs from Wedl's in the presence of enamel, and in being situated in the fore-part of the upper maxilla.

Mr. RUDOLF WEISER describes a case of a cyst at the end of a lateral incisor. This passed into the antrum but without perforating the lining of the latter. It was treated through an opening over the end of the root, which was exposed, and a small portion removed. The wound was plugged with iodoform gauge and syringed out with the following lotion. Salicylic acid one part, Salicylate of soda, Bicarbonate of soda, of each twenty parts, mix and take half a tea-spoonful and dissolve with half a tea-spoonful of chloride of soda in a pint and a half of water. Use a fresh solution each time.

The root of the tooth was crowned and at the end of six months nothing but a fine fistulous opening remained. This opening Dr. Weiser regards as desirable in such cases.

In the *Monatsschrift für Zahnheilkunde* for February SCHMIDT of Lübeck narrates a curious case of a young lady, who was much bewildered by a loud sound produced every time she opened her mouth. This was not only apparent to herself, but would be heard by a second person at a distance of five paces. It appears to have been such a nuisance to the girl that she had thoughts of committing suicide. Examination showed a carious second lower molar and a partially erupted wisdom tooth. The first molar had been lost. Light pressure on the masseter muscle in the neighbourhood of the wisdom tooth, produced the noise. The second molar was removed and massage applied over the jaw. In three months the sound had quite disappeared, the wisdom tooth having moved forwards. According to Schmidt, this sound was produced by the internal pterygoid muscle slipping over the crown of the wisdom tooth.

There are no other original articles but some interesting abstracts from German Medical Literature. The first is a case of SWALLOWING AN ARTIFICIAL DENTURE by a servant girl, aged 25, during her sleep. The plate was of vulcanite and carried four teeth, one of which was broken off. The plate could be felt on the left of the trachea below the level of the cricoid cartilage. As it could not be removed by forceps, and œsophagotomy was not permitted, it was forced into the stomach by means of a bougie. The patient was fed on potatoe-purée and on the third day the denture was passed per anum.

Another abstract is that of a paper of Dr. SANDMANN on the Physiology of the Cranial air-sinuses. Sandmann combats the notion that they are for the purpose of warming and moistening the air. As regards the frontal and antral sinuses, the introduction of a manometer, through a fistulous opening in the maxillary sinus, has shown that the movements of the air is but small. Moreover, the mucous membrane of these sinuses is too poorly supplied with glands to do more than keep the surface of the membrane moist. Further, the introduction of odorous substances into the various accessory nasal

sinuses, has shown them to be deficient in olfactory powers. Nevertheless, comparative anatomy shows that in lower animals they are of use in the perception of smell, though in man this function is confined to the region of the superior and middle lubricated bones. Sandmann concludes that these sinuses are developmental remains, which, however, by giving lightness render the balance of the head a more easy task than it would be were its formation a more compact one.

The last abstract we can now mention is from a paper of DR. OTTO ZSIGMONDY on "THE ALTERATION OF THE DENTAL ARCH BY THE SECOND DENTITION." The writer points out that the opinions of investigators are different and contradictory. This, he believes, to be in part due to the measurements being taken on macerated specimens, also to the difference between the child's and the adult's jaw being but small, and because the forms of the bones in different individuals are not the same, a poorly developed permanent dental arch would give a smaller curve than that of a well-developed arch formed by the milk teeth. He points out that Bell proposed, but did not carry out, measuring the same jaw at different ages. This Zsigmondy has done. He took plaster casts of the upper and lower jaws at different ages and made accurate measurements in two directions. Firstly from the most prominent point of the distal surface of the second milk tooth, and its successor the second permanent premolar, to the middle line between the central incisors; and secondly between the first mentioned points of opposite sides. He took the average of three cases. For the upper jaw he found the first line measured 32.2 mm. in the milk set, and 33.0 mm. in the permanent. The second line measured 42.2 mm. for the milk teeth 45.3 mm. for the permanent. For the lower jaw the following were the measurements. First line, milk teeth, 30.3 mm. permanent teeth, 29.8 mm; second line, milk teeth, 40.7 mm. permanent teeth, 41.9 mm. So that while the first measurement showed an increase of only 0.8 mm. for the permanent teeth of the upper jaw, and a diminution of 0.5 mm. for the lower; the second measurement was 3.1 mm. increase for the upper, and 1.2 mm. for the lower jaw. Thus while the permanent upper teeth increased but slightly in prominence as compared with the temporary, (the lower actually decreased) the width of the jaws, as shown by the second measurements increased, but more in the upper than in the lower. Zsigmondy also gives the results of taking a series of models of

upper and lower jaws at different periods between the sixth and the seventeenth years. He found that whereas at the sixth year the temporary central incisors were in contact, by the eighth year they were 1 mm. apart, and four months later were lost. The space between the lateral incisors increased by 5 mm. between the seventh to the ninth years. The lower incisors also moved apart, but not to the same extent as the upper.

The *Zahntechnische Reform*, Vol. 10, No. 20, contains an eloquent appeal for the founding of a Benevolent fund in connection with the "Vereins Deutscher Zahnkünstler." This society has attempted to start such a fund but without success, the writer urges that another attempt should be made.

There is also a note on a curious case of blood poisoning by nicotine. The patient was a cigar maker, who had suffered severe toothache, and had the offending member extracted. The pain was, however, not relieved, on the contrary the pain spread along the lower jaw and the face and neck began to swell. Medical advice brought out the fact that he was in the habit of constantly moistening his finger with his tongue in order to stick down the corner of the last leaf of a cigar. It was diagnosed that by this means he had by degrees introduced nicotine into a wound of the tongue. With discovery of the cause recovery followed.

In No. 21, P. L. M. gives his ideas on the arrangement &c. of the operating and waiting rooms. There is also narrated an instance of the way in which mercury may be carried in the air. A family of some position, moved into a new house which was previously renovated throughout. Shortly, various members fell ill, the tongue and gums swelled up and were painful; they had headache, slight fever and salivation. The cause of these symptoms was a mystery till it was discovered that the house had previously been used as a Thermometer manufactory. On removing the newly laid flooring, quantities of mercury were found underneath, this had penetrated beneath the cracks and had impregnated the air. Appropriate measures were followed by recovery. In this connection the Journal recalls the historical anecdote of the

case occurring in 1810, on board the man-of-war "Triumph." This had been loaded with mercury in the harbour of Cadiz. Now-a-days this metal is stored in iron bottles, then bags were filled with it and these were packed in boxes. The mercury of course passed through its porous coverings and impregnated the air of the ship. The sailors fell ill, the goats on board died and the rats were all found dead in the ship's hold.

The Journal repeats an instance of the extraction of teeth as a school punishment. The school-master, M— of the village L— combined the occupations of teacher and extractor of teeth. Not being pleased with eight of his pupils, he extracted for each, by way of punishment, one to three teeth. Brought before the Court for this action, he explained, that he only extracted milk or carious teeth, and that far from harming the children he actually had been of service to them. Dr. Gleitzmann of Belzig, was called in and found that in one child, incisor teeth had been extracted, in a second, canines, and in a third, back-teeth, and gave it, as his opinion, that the health of the children was improved. It is said, that since then, teeth-extraction has been looked upon as a *most refined* school punishment.

The Journal für Zahnheilkunde, for January 25th, contains the commencement of an editorial, on the chemistry of Carbolic Acid. There is also the conclusion of the trial of the dentist, Rudolf August Ferdinand Ebener, for causing the death of Ernest Granowsky, by administering to him Bromide of Ethyl. Most of the facts have already been mentioned in these pages. How about 22 grammes were administered, and anæsthesia not being complete, a few drops of Chloroform were added. How he completely recovered by the next day, became unwell, and vomited, in the evening the respirations became laboured, intermittent, and then again accelerated. Ice and Dover's powder were given, but the patient died during the night. The medical evidence was in favour of the accused, who conducted the administration in a proper manner. The idea raised by the counsel for the family of the deceased, that the medical man called in at the end had injected Opium, instead of Ether was negatived. And the plea of the accusing counsel that the defendant should not have tried experiments on a living man, was met by his

counsel, quoting the experiments of Professional Koch. In the end, the defendant was acquitted, on the ground that the judge did not hold it proved that the boy had died from the action of the drug.

Other Journals, which are to hand, we must hold over til our next notice.

“ DENTAL OBSESSION ”

Dr. V. GALIPPE reports (*Archives de Neurologie*, January, 1891) three cases of the affection designated by Professor Charcot “*obsession dentaire*”—that is, the state in which a patient is possessed by some morbid fixed idea in connection with the teeth.

CASE I.—A woman, aged 36, of neurotic descent, was prostrated with grief for many weeks following the death of her husband, vertigo, headache, and insomnia being present. These symptoms disappeared after five weeks' change of residence. An incident then occurred which proved to be the starting point of the obsession. The patient, while having a carious tooth prepared for filling, experienced acute pain in the pulp. From that moment her mind became possessed by thoughts about the tooth ; insomnia and emotional depression returned. Of the numerous dentists whom the patient consulted, none found any local disease or gave relief by the topical measures they employed. The patient by degrees became convinced that her teeth grew out of position, that the jaw projected on one side, etc. With a mirror in her hand she daily spent hours in scrutinizing the imaginary abnormalities. Eventually the patient rapidly improved and lost her morbid notions, under treatment prescribed by M. Charcot.

CASE II.—A cultivated American, at the time of consulting M. Galippe, was travelling in Europe, accompanied by a dentist whose function was to protect his patient from operative treatment on the part of other dentists. The obsession

took its rise from the operation of stopping a bicuspid. Great pain set in and lasted intermittently until extraction was performed. The patient then became tormented by the ever-present idea that further operations would be attempted and great injury would ensue. Although the many dentists who examined him were unanimous in assuring him that there was nothing in the condition of his teeth to justify his fears, he remained constantly harassed by painful sensations in his teeth and gums. Occasionally pain would shoot along the shoulder or up to the ear. Touching the lower jaw appeared to evoke pain. Much improvement was affected by hydro- and psycho-therapeutical treatment; the obsession and pains almost disappeared.

CASE III.—A lady who had reigned in the society of a large capital for many years experienced keenest chagrin when the time came for her to abdicate. Among other signs of age, she perceived that her teeth were apparently elongated and irregularly placed. Symptoms of alveolar pyorrhœa developed, which further engrossed her thoughts. She spent a large portion of her time seeing dentists, frequently visiting once twice or thrice in one day. By insensible degrees she became compelled to compress her jaws forcibly on the plates she wore. This impulse increased to such a degree as to cause her to pace about her room ejaculating and thrusting her fingers or some foreign body between the dental arches to impede their coming in contact. This aim then became the patient's obsession; she renewed and extended her searches for professional relief, ever requiring some new apparatus to be made. The involuntary contraction of the masseters and temporals merely increased, and set in whenever anything was introduced into the mouth. Through the advice of a distinguished physician all her remaining teeth were extracted. Aggravation of her condition resulted, and she finally drifted into profound melancholia with suicidal propensity. All these patients were predisposed to insanity. Each case shows that local treatment is futile if not baneful. Obsessions in relation to the tongue have within the last few years been noted by certain observers. The features common to these patients have been the existence of neuropathic taint, the dread of cancer developing in the organ, with absence of objective lesion.

(*British Medical.*)

Reports of Societies.

STUDENTS' SOCIETY NATIONAL DENTAL HOSPITAL.

The last Ordinary Meeting of this Society was held on Friday, February 6th, at 8 o'clock. Mr. R. Denison Pedley, Esq. *President*, in the chair.

The minutes of the previous meeting were read and confirmed.

Mr. R. Denison Pedley thanked the Society for electing him as President, expressing his feelings as those of honour at receiving their election. He also expressed regret at his recent retirement from office as Dental Surgeon to the Hospital.

CASUAL COMMUNICATIONS.

Mr. Clarence Masters shewed an upper second molar, attached to the bone between the roots of which, was an unerupted decayed wisdom. It was interesting, because at first sight it might have been taken for a case of gemination.

He also presented on behalf of Mr. Slight, a three-rooted lower molar.

Mr. HUMBY spoke of two cases.

1. A man 75, years of age, in 1873, had an upper central incisor pivoted, which is still in a thoroughly lasting condition.

2. A case of double hare-lip. The incisive bone was separated totally from the superior maxillary bones, and was only connected with the rest of the face by the vomer. The right nostril had to be plugged to keep it from closing, owing to the pressure exerted on it by the moveable intermaxillary bone. The operation of closing the parts was successfully performed by Mr. Smith of St. Bartholomew's Hospital. The patient's speech was rendered articulate, and the parts close with the exception of an orifice in the hard palate, a lateral incisor has also been erupted on the maxillary bone, and the upper lip has contracted.

(This case will be again mentioned at the Meeting in March).

Mr. SPOKES commented on the case and observed that it was particularly interesting ; because it was the third incisor which was supposed to be absent in man, and he took it that the lateral had erupted on the maxillary and not on the inter-maxillary bone, he hoped Mr. Humby would present models, so that the members of the Society might examine it, and place it on record.

Mr. FARO presented a model of a case, shewing considerable swelling of the labial and palatine plates of the right upper jaw produced by suppuration in the antrum, during a period of about three months, arising from an abscess in connection with the buccal roots of the first upper molar tooth. On removing the tooth, a small portion of the floor of the antrum came away, attached to the anterior buccal root, and was followed by a considerable discharge of pus. Subsequently the antrum was periodically syringed with a dilute solution of Condyl's Fluid, the discharge ceased and the swelling abated.

Mr HUMBY made some observations on antral mischief, caused by the introduction of foreign substances, such as a tooth into the antrum.

Mr. REGINALD BASCOMBE brought forward a second lower molar which he had extracted, having five roots, three of which were distinct, the others bifurcated at the apical end to form two.

Mr. CLARKE presented a lower bicuspid with distorted fang.

In commenting on the above communications the President said he had seen cases of pivoting which had lasted many years, and in his opinion, there was no better way than the old method of pivoting.

Regarding the case of cleft palate and hare lip, where the incisive bone was quite moveable, he agreed with Mr. Spokes that removal of the bone was the best treatment.

Respecting the lower bicuspid presented by Mr. Clarke, he said he was aware that by present methods, some dilacerated, or distorted roots were impossible of treatment, but perhaps the time would come, when one could simply apply a little corrosive sublimate to the pulp, and stop straight away according to the method described by Dr. Miller, of Berlin.

A general discussion then took place in which the President, Messrs. Spokes, Faro and Clarke took part.

No more Casual Communications being brought forward,

the President then delivered his Inaugural Address, in the form of a paper on "Dental Education."

Mr. Spokes proposed a vote of thanks to the President for his address which was seconded by Mr. Humby. In replying, the President said that his feeling in writing it was to give, if possible, even the slightest hint worth remembering, and he would be amply rewarded if such proved to be the case.

The meeting was then adjourned until Friday, March 6th, when Mr. W. R. Garrould will read a paper on some "Observations on the Development, Diseases and Deformities of the Jaw."

MANCHESTER ODONTOLOGICAL SOCIETY.

The annual dinner was held at the Grand Hotel, Aytoun Street, Manchester, on Saturday, January 24th, H. Campion, Esq., *President*, in the chair.

After the usual loyal toast had been duly honoured, Mr. G. G. CAMPION rose to propose the toast of "The Manchester and Salford Medical Charities." He said there were some very accurate and somewhat curiously constituted people, who reckoned that the average duration of human life, in this country, owing to the efforts and achievements of medical science during the last 50 years, had been prolonged something like two years and a fraction. Personally he had not much taste for such calculations, but he remembered vividly a case he saw some years ago at Bartholomew's hospital, where a man was cured of the severest physical suffering, by the removal of calculus from the kidney. That was not a singular but a typical case. It seemed to him a very much greater thing to restore a man, perhaps in the prime of life, to his original capacity for work and enjoyment, than simply to add a couple of years even to the life of the average man. It was in that way that the medical charities were adding to the pleasures of human life. and with those beneficent capital achievements, they combined the greatest and best of the three graces, the grace of charity, by that means placing those benefits within the reach

of the very poorest in their midst. It was with cases of that kind that the medical charities of Manchester and Salford were dealing daily, and that alone was enough to command not merely their sympathy, but also their hearty support. (Applause).

Dr. LEECH, who responded, said he was a great believer in medical charities, and did not agree with those who asserted that they did not encourage thrift and degraded those who used them. He thought the statement might be true in regard to workhouses, but not when applied to medical charities. He considered that an entirely wrong conclusion was drawn by those who pointed with dismal foreboding to the great number who attended these charities. Whether they were too many or too few, depended a great deal on what they considered was the position of Manchester. If Manchester was considered as a provincial town, then they had only that immediate population to consider. But if Manchester was to be the capital of the north, and bear the same relation to the north, as London did to the south, then it was the medical centre of an immense population, and they must increase their medical charities as rapidly as possible. (Applause.) There was, as they knew, a good deal of excitement going on in regard to medical charities. All of these charities were on the increase. In Salford they were increasing their hospital, he thought very rightly, and in Manchester they were thinking about it. He thought that many of them knew that the medical staff were of opinion that they wanted a very large number of additional beds to satisfy the requirements of Manchester, and by Manchester he meant the north of England. He hoped before very long that there would be a large increase in the accommodation provided by the Manchester Royal Infirmary, and all these charities were moving in the same direction. (Hear, hear.) There was one charity which he hoped would take a high place, amongst the Manchester charities,—he meant the Dental Hospital. The dental hospital had gone through the sort of difficulties incidental to all hospitals, but he thought that in time the dental hospital would become the centre in the north of England of all dental work. (Applause).

Mr. A. W. STOCKS, who responded on behalf of the Salford Royal Hospital, said that no institutions stood out with the beauty—both physical and moral—of the medical charities of this country. He believed in no other country were the

medical charities so true an indication of the feelings of the people as in this country. Here they were the outcome of private good feeling towards their fellow-creatures. The good they did was undoubted, although it had been questioned. He did not know whether the world would be better or worse without medical men—(Laughter). There was no doubt, however, that medical or surgical treatment prolonged life. For his part he believed that charities did a very providential and very acceptable work amongst the people.

Mr. WALTER WHITEHEAD next proposed "The Manchester Odontological Society," and in doing so said that when he reflected and looked back twenty years, he remembered the time when dentists were largely taken from the benches of the mechanics' shops, and had no status as a profession. Now they were a recognised profession, with distinguished members, and in close and friendly alliance with members of the medical and surgical profession. (Hear, hear.)

There had been a great tendency for years past to split up the medical profession into special departments—a tendency with which he had very little sympathy, but there was one department to which that did not apply, and that was the speciality of dentistry. He had noticed in the Transactions of the Society, that the son of an old friend of his (Mr. Lund) had read a paper before the Society, and the thought struck him that medical societies in Manchester had made a mistake in not much earlier giving an opportunity to the members of the Manchester Odontological Society to come to their meetings, and when subjects of common interest were under discussion to give them the benefit of their experience. (Hear, hear).

The PRESIDENT, who responded, said there was one reason why it was peculiarly appropriate that he should respond to such a toast. When he was asked at the original formation of the Society to join it, he looked shy at it, and said, No; and he said no, for this reason. He took a prominent part, and was deeply interested in the Midland Branch of the British Dental Association. The branch in question went through all its early troubles in Manchester, and he thought this new Society might take to quarrelling with it, and therefore he withheld his support. But in a short time he became wiser, and then he began to see that there was room for the two societies to work side by side in a friendly way, and he therefore became a supporter of the Manchester Odontologi-

cal Society. He had no reason to regret his connection with it, but rather felt that it would be a great pleasure to him to support the society as long as he had the opportunity, and was able to do so. (Applause). Their profession, as had been said by one of the speakers, was quite a new one, and they had had great difficulties to contend with. They were now in the middle of their difficulties, and in connection with their profession a few remarks had been made in regard to a Dental Hospital. He was very much interested in the subject, and was very anxious to see a new and suitable building prepared for that charity. (Hear, hear). Hitherto the chief difficulty, in all the large towns where such a hospital had been started, had been to get a good building, because people would give to an old-established charity where they would not give to provide a new one; therefore most dental hospitals had commenced with a building made out of an old dwelling house. That, they all knew could not be successfully performed unless at a great waste of money, and even then the accommodation was very insufficient. He believed, however, that the time would soon come when they would have a thoroughly good dental hospital in Manchester. Referring again to the Society he said it was a very valuable one, for it brought the members together, for the discussion of professional subjects, whereby each member was bound to receive some benefit. He thanked them for the heartiness with which they responded to the toast.

Mr. W. SIMMS then rose to propose the toast of "The Visitors." In doing so he complimented the members on having Dr. Leech, who held such an important position at the Owens College, and the Royal Infirmary, amongst them. He (Mr. Simms) once attended a course of lectures at Owens College given by Dr. Leech, and he always remembered the unvarying patience he brought to bear on the discharge of his duties—duties which were performed by him with the greatest possible success. They had there that evening a gentleman who represented a most important society, because it was a representative of Great Britain—he alluded to the Odontological Society. That society as he supposed everybody was aware, had existed for a great number of years, and had done, and continued to do, most important scientific work. They had amongst them that night Mr. Hutchinson, (applause) and it was a pleasure to know that the Odontological Society of Great Britain, in looking round for a man to follow the

great and good men who had been its presidents in the past, were able to alight upon a Manchester man, (applause). He thought they might claim that Mr. Hutchinson, so far as much of his dental education was concerned, was a Manchester man, (applause).

Mr. HUTCHINSON returned thanks on behalf of "The Visitors" and for the kind manner in which Mr. Simms had coupled his name with the toast. It was quite true that he was almost a Manchester man, as he had spent nearly half his life there, and had received a portion of his dental education as a pupil of Mr. Hooton of that city, to whose good example he owed much of his success. He felt it a great compliment to be asked to come, as he was the first Manchester man who had been President of the Odontological Society of Great Britain, and he accepted the invitation as the representative of his London colleagues and friends. He was very glad to hear from the President, Mr. Campion, of the efforts which were being made to build a new Dental Hospital in Manchester, and he trusted their efforts would be crowned with success, as it was much easier to build a new Hospital, than to alter or enlarge on old one. Mr. Campion had spoken to the two Dental Societies in Manchester and neighbourhood—the Midland Branch of the British Dental Association, and the Manchester Odontological Society, the former fulfilled an important part in carrying out the provisions of the Dentists' Art, and in discussing dental politics,—the latter in scientific and practical work, and the existence of the Manchester Odontological Society, was amply justified by the successful meeting that evening. He trusted, however, that Manchester members would not forget the duty they owed to the Odontological Society of Great Britain. He also reminded the members of the British Dental Association that the annual meeting would be held in London in August this year, and he trusted that the London members would be honoured by the presence of the Manchester members, so that they might be able to return some of the kindness which had been shown to him, as their representative, that evening.

Mr. Hutchinson referring to the question of education dwelt upon the fact that the preliminary examination in arts was the same for the dental as for the medical student, that the curricula were the same for the greater part of their course that the special subjects useful for a medical practitioner were

replaced by special subjects, useful for a dental practitioner, and that the licence in dental surgery of the Royal College of Surgeons was granted to the dental student, and entitled him to rank as an educated and professional gentleman. In conclusion Mr. Hutchinson on behalf of the Benevolent Fund of the British Dental Association, thanked the Manchester Odontological Society for their recent generous donation to the Fund.

Dr. YOUNG proposed the health of the President, who he said, was an old friend to many members of the Manchester Odontological Society, and also to many who were not members of the society. Ever since he could remember, Mr. Champion's name had been associated in that district with all that was for the good of the dental profession. He had identified himself wherever he could with the progress of dentistry. He was interested in everything that tended to the benefit of the dental profession generally, and he had, in that way, gained for himself a position which he (Dr. Young), could only say had won for him the affectionate regard of all who had known the work he had done. (Applause).

The PRESIDENT briefly replied, and the members then separated.

Dental News.

THE HOSPITALS COMMITTEE.

On February 2nd, Mr. ROBERT BRASS, the Receiver of St. Thomas's Hospital, stated that he received a salary of £600 a year and lived outside the hospital. He had no commission either on rents collected or on appeals. He was appointed by the general Court of Governors. The treasurer and four almoners—governors—formed a court, which met once a week. Two was a quorum. The hospital had property in London, and in Cambridgeshire, Middlesex, Berkshire, Essex, Hampshire, Hertfordshire, Kent, Derbyshire, Yorkshire, and Wiltshire. The income from the country estates last year amounted to £14,481. The estates were managed by a land

surveyor and by local agents. He was responsible accountant as well as receiver. To all intents and purposes St. Thomas's was a free hospital. Although there were about 340 governors, it did not follow that cases presented upon their letters would be admitted. Anyone applying casually, if it was a bad case, would certainly have the preference. In St. Thomas's Home were two wards occupied by paying patients, and the receipts from them amounted to £5,600 in 1890. At least 60 beds were unoccupied for want of funds. There were two wards entirely unoccupied. The object of having paying beds was primarily to get funds. The nearest hospital on that side of the river was Guy's. Last year the hospital paid £2,380 in rates. From the London property, the total receipts were £31,655, which comprised £11,980 from Southwark, £11,133 from the City, £7,146 from Hackney and Clapton, and £1,468 from Wapping. During the last ten years the receipts from the London estates had increased, but from the country estates they had decreased. The total gross receipts were £67,000, and the net sum received £40,000.

Mr. F. WALKER (the Steward of the hospital) said he had occupied that position for forty years. He received £555 a year and residence. He had the general management of the hospital over all the officers, and kept account of all the patients when admitted, their names, residence, the nature of their disease, and the result of their treatment. He was responsible to the treasurer, who was a resident officer. The present hospital was opened in September, 1871. Previous to that, they were for nine years at Surrey Gardens. Before that they were at London Bridge, but were moved off in 1862, the site being required by the South-Eastern Railway. To complete the work on the present site, the authorities had to borrow £100,000, and that sum was now being paid off. The income for hospital purposes is he thought, about £30,000. There was a resident physician and a resident surgeon. On the medical side there were four house-physicians and a large number of clinical clerks, and on the surgical side there were four house-surgeons and a large number of dressers. The whole of the visiting staff were paid, but they only received small fees. They could fill the hospital if it were double the size. Many good cases are sent away. As to the food supply, the Witness stated that there was a kitchen for the patients for the whole of the blocks of the hospital, and there

were separate kitchens for the medical officers, for the nurses, and for the paying patients at St. Thomas's home. He was responsible for the quality of the food, and complaints as to the food both for the patients and officials would come to him. There were, he added, two chaplains at the hospital—one resident and one non-resident. The salary of the former was £275 and a house, and that of the latter was £150, and he had also the Vicarage of St. Thomas's. There was no convalescent home, but from a Samaritan fund the hospital sent patients to various convalescent homes.

WILLIAM M. ORD, M. D., F.R.C.P., said he was physician of St. Thomas's, and had been for twelve years Dean of the Medical School. He thought it would be very much better that the large general hospitals should have their own schools—that applied particularly to the study of practical medicine and surgery. He thought it better that the large schools should carry out instructions in all subjects, but as things advanced the smaller ones should be grouped for the earlier subjects—in fact, taking it altogether, he would not be sorry to see the whole of the teaching of the earlier subjects taken from the hospital schools and relegated to some central body. A greater uniformity of study would thus be obtained. The present number of students at St. Thomas's was nearly 400. There had been a great increase during the last few years. For the whole curriculum the students paid 125 guineas. The students' fees produced last year between £8,000 and £9,000. The whole amount received from fees is carefully stated, and from that is deducted the amount due for expenses, and then there is a division of profits, so to speak, in the proportion of two parts for the lectures and one part for the teaching in the wards. The third part is divided in a certain ratio, and the teaching is divided into shares calculated upon a basis of the actual hours and amount of work done by each person. The witness stated that out of £8,500, the expenses amounted to about £3,000. The schools attached to the hospital did not increase to the expenses of the hospitals, for on the contrary, the work now done by the unpaid officers would have to be paid for. In reference to the question of out-patients Dr. ORD said there was certainly no abused in their treatment at St. Thomas's. He was in favour of out-patient departments. Of course he knew it was said by some economists that out-patients departments were demoralising. It would no doubt, be possible to increase the value, both for the genera

public and the hospitals, of the out-patient department if there were some sort of relation between hospitals and the Provident Dispensaries around them. Special hospitals, such as opthalmic hospitals, were a necessity of great value. He did not, however, at all approve of cancer or consumption hospitals, and special institutions for them were unnecessary, as the patients could be equally well treated in general hospitals.

On February 5th, Mr. JAMES GADSTONE WAINWRIGHT, Treasurer of St. Thomas's Hospital. He was an entirely honorary officer, and resided in the hospital. His powers as treasurer were that, as superior officer, he had the control of all the other officers in every department, and in case of complaint or discovery of any abuse, he had the power to correct the same, and, if necessary, submit the circumstance to the almoners or the Grand Court. He might suspend the offender if necessary. Further, he had to report the receipt of all legacies and benefactions. There were 42 beds reserved for paying patients in St. Thomas's Home. The minimum payment was 9s. In addition to the Home, there were some paying patients in the wards. That was done under the Charity Commissioners' scheme, and they were called the paying patients. Last year about £229 was received from that source. The object of receiving payment from these patients is to provide funds for the hospital. If we had plenty of money, all these beds would be open free. There was a large out-patient department. There was no inquiry office. It would be very expensive. The question had often been discussed, but no definite conclusion had been arrived at. He often spent a good deal of time in looking after the out-patients and made inquiries where he considered necessary. The diminished income of the hospital was due chiefly to the agricultural depression. That would not account for it all. There are large sums to pay for interest for the money borrowed for the building of the hospital. His experience was, he said, that the hospital was not on too extended a scale. Some years ago the authorities had appealed to the public for £20,000. The response from the public was very small; the whole amount was obtained, but nearly all from the active friends of the institution.

Miss ENTWISTLE, late nurse of St. Thomas's Hospital, then stated that she commenced training in 1883, and that lasted for fourteen months. Altogether the work of the nurses there was too long and too exacting. Those with long leave had to work seventy-nine hours, and others seventy-three hours. They had three weeks' holiday in the year. They were called up at night in the event of operations, notwithstanding being kept up until after 10.35 if there was a prospect of an operation taking place. The whole responsibility of what happened in the ward during the day or night was on the shoulders of the sisters. The nurses considered themselves very well off as compared with those at other hospitals. Their lodgings and food are very much better. But at the same time although they are all select, strong, healthy young women, a great number of them break down. There is too much untrained labour.

Miss GORDON, matron of St. Thomas's Hospital, said she had had previous experience as a matron at Leeds. She was trained at St. Thomas's. There was a staff of 115 nurses. The question of the dinner hour was now under consideration, in view of the sister of the ward and the trained nurses being away at the same time. They were sometimes so pushed for nurses that they had to send out. That was only in exceptional times. The nurses had a good deal of extra time to themselves. They had two hours off every day, and every week from half-past one to six for recreation. The sisters received from £35 to £50 a year; the sister superintendent received £60; and she (Miss Gordon) received £300 a year and a month's holiday. Some of the probationers break down; and they go away if they are not strong. She thought that the nurses at St. Thomas's were not overworked. Reckoning the hours the nurses had off on Sundays, their average hours would not be more than sixty hours a week.

Dr. SEYMOUR SHARKEY, physician to the hospital, stated that after a long experience of St. Thomas's out-patient department, he did not believe that it was seriously abused in any way in regard to the financial position of the persons who attended.

At the Meeting, February 9th, Mr. CHARLES TODD, secretary of St. George's Hospital, said he resided in the hospital, and had salary of £400 a year. The hospital was established in 1733, and it was practically a free institution. There were no paying beds. There was a maximum of 356 beds, and the average number occupied was 335. If the cases for admission were equally urgent, those having the governors' letters would have the preference. Of the in-patients admitted last year, 15 per cent. were servants, but 6 per cent. of these were out of situation, so that only 9 per cent. of the servants were in situations, and they would be eligible at any hospital. Persons admitted to the hospital belonged to the working classes. The ordinary expenditure last year was £27,364, and extraordinary expenditure £950. The funds came from subscriptions, donations, dividend, and a large sum from legacies. The hospital possessed a few houses in London from which the rents were £1,056. The annual subscriptions last year were £6,644; the donations, £1,754; a donation of £1,000 of stock transferred to the charity; and the legacies amounted to £27,781, but that was quite exceptional, the average of legacies being about £5,000. The system of nursing was similar to that at other hospitals. During the last ten years there had been a considerable improvement in regard to nurses and to nursing. There were wardmaids in every ward. There was no nursing institution to provide private nurses. They only trained nurses for their wards. The amount of money invested from which interest is derived is £441,000, and the dividends amounted last year to £12,642, and the difference between that and the expenditure was derived from subscriptions, donations, and legacies. The whole of the £20,000 legacy was last year invested. Accidents from the park are placed in a different category. And they generally make a liberal donation.

Mr. H. H. CLUTTON, Senior Assistant Surgeon of St Thomas's hospital, next stated that on his side the out-patient department was not crowded. The number each surgeon had to see was limited. The trivial cases beyond that number were seen by the house-surgeon. He did not deny that the out-patient department may starve the poor outside practitioners in certain cases, but there is more outcry, than is justified. A good deal of evidence might be got in favour of the out-patient department from outside practitioners.

Dr. WHIPHAM, the Dean of the medical school at St

George's, said that the number of students was about 140. The fee paid by students who entered for the whole curriculum was £120. There were also lower fees for those who had had a certain amount of scientific work previously. There were also special fees for those who entered for special purposes. The whole of these fees made up the income of the schools, which was about £4,500 a year. That had nothing to do with the hospital. Out of those fees the lecturers and expenses were paid. That was generally about £2,000. The actual practical part of the profession must be taught at hospitals, but the scientific part—such as physiology—should be taught at a central school. The class of persons who were out-patients were not in such a condition as to be able to pay fees to medical men. If not attended at the out-patient department, they would have to go to the Poor Law.

Dr. ISAMBARD OWEN, Senior Assistant-Physician of St. George's, next gave supplementary evidence as to the students fees, and stated that, after the general expenses of the schools were paid, the residue was divided among the lecturers and teachers. They were paid by a fixed salary, and the residue divided among the lecturers according to a fixed patronage. At present no one at St. George's would get more than £100 a year at the school, and the minimum might be about £30.

At the Meeting February 12th, Mr. ROBERT BRASS, made a few supplimental statements.

Mr. CLARE-MELHADO, Secretary of the Middlesex Hospital, stated that he received a salary of £300, with board and residence. He was responsible to the weekly board and the committee of governors, and had the control of every department. The hospital was founded in 1745, and had 307 beds. The average number of occupied beds was between 250 and 260. There was 220 beds devoted to medical and surgical, and 24 to cancer cases. Subject to the approval of the weekly board, he had power over the officers to the extent of suspending the servants or officers. That control did not extend to the nursing establishment, the nurses and female servants being under the lady superintendent of nursing. With the excep-

tion of scarlet fever and infectious diseases, all cases were taken into the hospital. The weekly board and the treasurer managed the finances. The funds were derived from dividends annual subscriptions, donations, rents, grants from the Hospital Saturday Funds, and legacies. In 1890 there was derived from dividends £6,357, £2,851 from annual subscriptions £6,538 from donations, £234 from almsboxes, £2,083 from the Hospital Sunday Fund, £411 from the Hospital Saturday Fund, £195 from rents, and £196 from incidental receipts. The sum total of the income was £20,634, but the average income was from £15,000 to £16,000. The disbursements for 1890 amounted in the gross too £27,117, which included an extraordinary expenditure of £2,584. The average expenditure was about £33,000. There was an extraordinary expenditure nearly every year for buildings or improvements of some sort. The hospital was practically free. Last year there were 3,109 in-patients. In-patients were seen by an admitting officer, who dealt with the cases, and he referred them to the medical officer, who admitted all patients to the hospital at a certain hour. When there was any excess of applicants the most urgent cases were selected. Paying patients were not received. The out-patients also see the same officer. The Medical Committee met every week, and sent up its recommendations to the weekly board. The matron received £130 a year, with board and residence, and the sisters received £30 and uniform, with board and lodging, and they were entitled to gratuities and a pension after having served a certain period. The staff nurses commenced as probationers, and received for their first year £13. The lady superintendent could suspend but not dismiss. The sisters went on duty at 8 a.m. and left at 11 p.m., but were actually on duty about eleven hours. They had three weeks holiday in the year. The staff nurses went on duty at 7.30 a.m. and remained until 9 p.m., but their actual work was about ten hours. They had sixteen days' holiday. The nurses did sweeping and dusting, but the ward maids did the more menial work. £47,000 had been left for cancer wards. That sum could not be touched for any other purpose. It was a separate fund, towards which, however, legacies were left from time to time. The fund was not sufficient to maintain the cancer ward. The gross amount of the capital of the hospital was £252,786. The annual cost per occupied bed at £87 12s. 0½d. He estimated the cost of the out-patient department at £2,620 a year. It was impossible to

take the cost of a patient except by estimate. The cost per bed at the Middlesex was larger than at St. George's. But the cancer beds added materially to the cost, probably half as much again. He thought that all the hospitals should, if practicable, render their accounts on the same basis. A central board of control of hospitals would be advantageous.

Mr. EDWARD FADDON, the Resident Medical Officer of Middlesex Hospital, stated that he received a salary of £200 a year, with board and lodging. He had the general medical supervision over the hospital so far as the sanitary arrangements were concerned. He was responsible for all the admissions to the hospital, and exercised general authority over the house-physicians in regard to their work in the wards, and kept a general supervision over the wards. He had been in that position for twelve years. The out-patient department is crowded. He did not think that an inquiry officer would be worth his pay, as he did not consider it possible for any one man with the enormous out-patient department of the hospital to make sufficient inquiries. The out-patient department he did not think was abused. The out-patient department was valuable for teaching purposes. It might be extended for consultative purposes. He was of opinion that there was no need for special hospitals to treat cancer patients. It was most desirable that there should be associated with every general hospital special departments. A certain number of midwifery cases were attended to outside the hospital by students, who, in their first few cases, were accompanied by an experienced medical man.

Mr. A. P. GOULD, the Dean of the School of Middlesex Hospital, stated that during the last twelve months there were 127 new students' entries, of whom 55 were general students, 7 dental students, and 66 occasional students. There were from 250 to 300 students in attendance at any one time. The payment for the full medical curriculum was £100 in one sum, or £125 if paid in installments. The curriculum lasted for four years. The fees more than covered the whole expenses. The receipts were about £5,000, and the expenditure £2,000 so that there had been about £3,009 for division amongst the teachers. That was divided into 600 shares, the minimum being 10 guineas, and the maximum might be about £350. I think we could improve medical education in two or three directions. If besides their ordinary education, students were grounded in chemistry, physics, and a little

biology, and were familiarised with scientific methods, the whole medical curriculum would be improved. That might be done if the General Medical Council insisted upon chemistry and physics being a necessary part of the preliminary certificates. He did not consider that the out-patient department was abused to any large extent. Patients suffering from cancer had to fill up certain forms, and were then put on a rota and were sent for as vacancies occurred. The cancer ward was, in fact, an asylum. He thought that special departments of general hospitals were better than special hospitals. There were some advantages in large children's hospitals, as the medical staff in such institutions obtained a wider experience as to the treatment of children.

On February 16th Dr. THORNE THORNE, assistant medical officer Local Government Board and lecturer at St. Bartholomew's Hospital, stated he made an investigation into the sanitary state of the two nurses' homes and three of the principal ward blocks of the hospital. The principal nurses' home was so perfect that it would be hardly possible to find any better drainage or sanitary arrangements. The second nurses' home was an old building and attempts had been made to put the drainage in good order at very great expense. But there were certain faults which should be altered, although they had nothing to do with the outbreak of diphtheria. As to the three principal ward blocks of the hospital, he advised two minor improvements, and he had been informed that instructions had been given to remedy all those matters. He had not yet sufficient materials to form a decided judgment, on the outbreak of diphtheria, but he felt fully convinced that any sanitary defects connected with the ward buildings could only have had the most trivial effect on the outbreak. At St. Bartholomew's they have lady nurses who to a large extent out of kindness to the children have been in the habit of carrying these diphtheria cases about, and in that way they may contract diphtheria by inhaling the exhalations from the children.

Mr. W. H. CROSS (clerk of the hospital) recalled, stated that a periodical examination of the sanitary conditions of the hospital was not made. No one could deny that the hours of the nurses were long. He did not think them underfed. He had a daughter as a nurse at the hospital, and he did not believe

there was any ground for complaint. It was absolutely untrue that any of the medical officers had had an attack of diphtheria. There were four cases of typhoid among the nurses, and they had all been nursing typhoid patients. The authorities had never gone to the Charity Commissioners, *in forma pauperis*, asking to be allowed to take in paying patients.

Mr. P'ANSON (surveyor of the hospital) stated that he had general supervision of the hospital, and his duties required him to report anything that was wrong as to the sanitary state of the institution. He had a report from the clerk of the works every week. He was a salaried officer, receiving 300 guineas a year, and a commission of $2\frac{1}{2}$ per cent. on all new buildings. He had made two recent reports as to the sanitary condition of the hospital—one on December 11th, 1890, and the second in the present month. His inspection included all the wards, the nurses' home, and the matron's house. He had been three years surveyor but he had not made an inspection of the drains.

Dr. ROBERT BARNES, F.R.C.P. and F.R.C.S., said there were six supplementary general hospitals without schools—the French, German, Italian, Great Northern Central, Metropolitan, and the West London Hospitals. There were ten hospitals for children, with 505 beds; one for children with hip diseases, with 50 beds; four for women's diseases, 225 beds; four for consumption, 615 beds; one fever hospital (Islington), 200 beds; five metropolitan fever hospitals under public management, 1,141 beds; a small-pox hospital, 108 one for heart disease (Soho Square), 26 beds; three for incurables, 301 beds; the Lock Hospital, 240 beds; three hospitals for lunatics, 656 beds; six lying-in hospitals, 175 beds; five ophthalmic hospitals, 195 beds; three orthopædic hospitals, 118 beds; one for stone, 24 beds; Seamen's Hospital, 225 beds, and a branch in the Albert Dock with not less than 20 beds; the accident hospital at Poplar, 51 beds; four throat and ear hospitals, 52 beds; four throat and ear hospitals, 52 beds; three for skin diseases, 52 beds; one for cancer, 120 beds; two for fistula, 42 beds. He did not pretend to say that that was an absolutely complete list, and it gave a total of 6,494 beds.

One great reason for the cancer and other special hospitals is that they afford medical men a better opportunity to study the special disease than they could have at the general

hospitals. He would allow hospitals as much freedom as possible. If there were any State control it would stop the flow of charity and individual philanthropy. He would not like at present to trust the County Council.

On February 19th, MR. F. C. MELHADO (Secretary of the Middlesex Hospital) made a few amendments to his previous evidence.

MR. A. W. READE (Secretary of the Charing Cross Hospital) presented a balance sheet of the institution which had the previous day been agreed to at the annual court of governors. The hospital was founded in Villiers Street in 1820, and thence it was removed to its present situation in 1831, and was opened in 1834. It was quite free. Letters were issued for both in and out-patients, but it was not compulsory upon patients to have a letter. Last year there were 2,165 in-patients. The test of admission was that the applicant was a poor person in need of hospital treatment. A patient bearing a governor's letter would have no preference. Funds were derived chiefly from subscriptions, donations, and legacies. There was a little property. The income was about £6,000 a year. Legacies last year were only a little over £1,000, the smallest sum they had received since the hospital had assumed its present importance. The annual subscriptions last year amounted to £1,838.

With the exception of about ten beds kept vacant for accident cases, all available beds were occupied almost throughout the year. There were 175 beds, of which 165 were considered working beds.

There are five resident house physicians and surgeons—who admit to the beds. Nearly all urgent cases are admitted at once. He had a salary of £400 a year, and was non-resident. In his absence the chaplain (who received £100 a year and board and lodging), and was responsible. There were ten sisters, seventeen nurses, and twenty-four probationers. They began to have their own nurses in March, 1889, and trained them at the hospital. The sisters went on duty for eight hours and a half a day, one Sunday five, and next Sunday nine hours, a total average of fifty-eight hours a week. The nurses and probationers had ten hours a day, on one Sunday nine, and the next six hours. The nurses' average was sixty-seven, and the probationers sixty-nine

hours a week. The nurses did nothing but nursing. There was no pension for them at present, but the question was under the consideration of the council. At night there was a nurse in each ward and two in the children's ward. The nurses began at £22, going up to £25, and had in and out-door uniforms, and £2s. 6d. a week for washing. The probationers were not paid the first year, had £15 the second, and £50 the third year, and had uniform and washing. The Hospital Sunday Fund last year awarded the hospital £1,010, and the Saturday Fund £261. The sanitary arrangements of the hospital were in good order. The sisters had a month's holiday, the nurses three weeks, and the probationers had an occasional week and they could all have a half-holiday without difficulty.

Mr. STANLEY BOYD, surgeon to Charing Cross Hospital and Dean of the medical school, stated that the number of students last year was 228. There were 31 new general students, 35 dental students, and 16 occasional students. The school was increasing. The general students paid 90 guineas in one sum, or £100 by five instalments, for the whole curriculum, which took four years. The dental students paid 54 guineas, or 62 by two instalments. The total gross revenue of the school last year was £4,070; out of that, the expenses of the school had to be paid. One-fifth was taken off all fees for the hospital. That amounted last year to £814; one-fifth was taken off for school management and three-fifths were divided among the hospital staff and lecturers. The school was a separate building and was connected with the hospital by a subway. The average amount earned from the winter classes was £170, and from the summer classes from £60 to £80. The minimum a teacher or lecturer might earn might not be more than £60 for the summer course. The clinical fees were divided according to shares.

It would, however, be a great advantage if the hospitals were relieved entirely of teaching botany, zoology, and physics, a certain amount of the rudiments of chemistry; the students ought to pass that before they began their medical education. A central institution for the purpose did not seem necessary; they could go to the science department of colleges. It would be much better if there were a uniform system of medical examination. It would be disadvantageous to have to bring everybody in the kingdom to one place.

Dr. FREDERICK WILLCOCKS, out-patient physician to Charing Cross Hospital, then gave evidence.

We learn that the operating rooms of the Dental Hospital of London are about to be lighted by electricity. The Committee of management are enabled to carry out this important improvement by the promise of a donation of £100 from Mr. Henry Whiting, one of the Vice-Presidents of the hospital.

The Annual Dinner of the Licentiates of Dental Licentiates and of the Odonto Chirurgical Society will be held on Friday March 13th, in the Balmoral hotel, Princes Street, Edinburgh. Members, who are invited to bring a guest, are requested to reply to the Secretary. Mr. John S. Amore, 7, Abercromby Place, Edinburgh.

EDINBURGH DENTAL HOSPITAL.

The Annual Meeting was held on January 29th, when it is stated that 8,855 operations were performed. Of these 3,239 were fillings, but there were 281 cases treated with anæsthetics, involving the extraction of 1,500 teeth. The expenditure exceeded the income by £27, which was accounted for by the appointment of a dental mechanic, from whose services the hospital has not yet had time to reap much pecuniary benefit, but it is expected his appointment, being a valuable addition to the equipment of the hospital as a training institution, will ultimately prove to be the means of attracting students in larger numbers, and thus add to their resources. There is at present a balance of £306 at their credit. Dr. Littlejohn, who presided, spoke of the great benefits which the institution had conferred on the respectable working class and the very poor. He mentioned that the police attended the hospital for treatment, and were loud in its praise, each individual feeling as if his particular case had engaged the attention of the whole staff. He approved of the appointment of four anæsthetists. Cases of death by misadventure while under the influence of anæsthetics were brought under his notice almost every fortnight by the Crown authorities, and they had often to deplore that no one of experience had been in attendance. Dr. Smith thought the gratitude of the general public ought to take a tangible form, and said that subscriptions would not be objected to if they were a good deal larger.

Mr. W. Bowman Macleod suggested that an effort should be made to secure a grant from the War Office for attendance on the military in Edinburgh.

The Chairman said he would use his influence to get a subscription from the police force.

It was agreed to advertise for three extra junior assistant surgeons.

VACANCIES.

National Dental Hospital, 149 Great Portland Street, W.—The Post of House Surgeon will become vacant March 14th, Candidates must possess the L.D.S. Diploma. Applications with testimonials to the Secretary.

The Victoria Dental Hospital of Manchester, 98 Grosvenor Street, C.-on-M., Manchester.—There is a vacancy for an Assistant Dental Surgeon. Candidates are requested to send their applications with testimonials to the Secretary, on or before the 14th of March.

The Dental Hospital of London, Leicester Square, W.—There are four vacancies for Demonstrators. Applications accompanied by testimonials, to be sent to the Dean, on or before March 16th.

APPOINTMENTS.

George O. Whittaker L.D.S., England. Appointed, Lecturer on Operative Dentistry at Owens College, Manchester.

Sibley W. Read, L.D.S., Eng., has been appointed Dental Surgeon to the Metropolitan Hospital.

ANSWER TO CORRESPONDENT.

EXMO.—We do not think you are eligible, but you should apply, stating full particulars to the Registrar, General Medical Council Office, Oxford Street, London, W.

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READY MADE CONTOURS AND CROWNS OF AMALGAM.*

By JOS. ARKÖVY, M.D., &c., Buda-Pesth.

Mr. President and Gentlemen,—Contour filling is one of the most prominent subjects now under discussion in dental literature. The subject needs no further advocacy, for our best writers and practitioners have adopted contour filling, and to-day it may be considered as an operation not only destined to exhibit the skill of the operator, but acknowledged to possess the essential basis for an operation, viz., *indications*.

All the disadvantages arising from simply filling approximal cavities of teeth, after separating by the Arthur method, indicate the superiority of contour filling. Restoration of the anatomical shape was the principal and the only scope. A good many instructions and practical hints supporting the task are contained in the literature on the subject, of which you are well aware. Some time ago† the attention of the profession was directed to another point concerning contour filling; that is, *prevention of injury to the inter-dental space*, viz., inter-dental papilla and the inter-alveolar septum.

It may be considered as proved that any contour filling possessing these two qualities will answer the purpose, and

* Read before the Odontological Society.

† J. V. Black, M. D., Jacksonville, Ill., "Dent. Rev.," July, 1890; Geo. H. Winkler, M.D., and G. A. Wilson, D.D.S., "Internat. Dent. Journ.," Dec. 1890.

be correct. Gold is maintained to be the best material for contour filling, and no doubt it is in general ; but, taking into account the various conditions of approximal cavities in præmolars and molars, which more frequently want contouring than front teeth, it might be conceded that contour fillings of gold are very rarely indicated in such back teeth ; because, first, of the regularly wanting wall strength ; secondly, the proximity of the cervix ; thirdly, the impossibility of control while annealing the first quarter of the gold. If we add to these arguments the effective, and for the case valuable, indication of combined fillings, where we are obliged to put aside gold as being a non-combinable material* in favour of amalgam, then it will be seen that, besides the excessive time and work required in gold contouring in bi- and multicuspidated teeth, amalgam (combinable with gutta percha or copper amalgam) would serve better than gold, supposing that we are able to use this material for shaping the lost part of the tooth-crown. Hitherto the difficulties in using amalgam for contouring purposes were that it did not keep the contour when properly mixed, and, if it did, it usually had a surplus of mercury, and would be expected to undergo shrinkage and low edge-strength. I pass over the difficulty which we encounter during the process of shaping. An incisor or canine can never be compared in that respect with either a bicuspid or a molar crown, as the true morphological form can hardly be attained.

To meet the exigencies of making amalgam serviceable for contouring, and even crowning purposes, I have the honour to bring before you a somewhat new method of operation and of using that material. The starting idea was : Why should we build up contours, parts of crowns, and whole crowns by such an amount of labour, the former losing parts just when nearly ready, the latter again (crowns) being dependent on a foreign filling material, which will never intimately unite with the crown (porcelain or metal) itself ? If we had prepared præmolars and molars of amalgam, wherever a large amalgam filling is indicated, the prepared piece of the amalgam crown would unite intimately with the filling in the cavity, and give us filling and contour or the whole crown

* Tin gold cannot be considered as a combined filling ; it is a combined material, and there is no reliable statement as yet that it possesses such qualities as copper amalgam or gutta percha are endowed with.

with one blow, and would provide us with a tooth crown very much in advance of all that could be made by freehand shaping. At the same time, we should not be obliged to deviate from the right way in being able to use on the cervical part copper, and sometimes even gutta-percha, for prevention of re-decay.

The præmolars and molars, which I have the pleasure of presenting now, are made after natural teeth,* and possess the precise morphological shape which we want for crown work, or, cut into segments, for contours. The directions for use may be summed up as follows :—

1. Take impressions and bite from the prepared tooth, and selecting the anatomically suitable amalgam crown, have it fitted in your laboratory to the model, somewhat lower than articulation requires ; one millimeter will do. If one part of the crown is wanted, have it cut by a thin saw, and filed as required, and the hollow (inner) part provided with retaining pits or deep undercuts (Arthur disc). For contouring purposes the molar crowns may be cut into 2—4, the præmolars into 2—3 segments, reserving the not applied part for another suitable case. Time hardens, and air has no deteriorating effect upon the crowns.

2. When starting for stopping, put the piece (crown or contour) into chloroform, in order to get rid of any fat that may possibly adhere to the mass. The amalgam for the filling being prepared, take a small quantity of it, with the addition of one small drop of mercury, and rub that in with a polisher upon the surface furnished with undercuts. Now fill the amalgam into the cavity (with or without cofferdam) to the level of the edges, covering these as well. Then put the amalgam crown or contour upon the filling, pushing the piece with your two forefingers several times, in labio-lingual direction, until it attains its proper position. No hard pressure should be exercised upon the contours, their body being too weak ; entire crowns, however, ought to be pressed firmly by finger or by wooden rod. After that, polish, and take off *very carefully* the rubber dam, if in use ; and push a small piece of letter paper between contour or crown and approximal surface of the next tooth, in order to keep the piece in

* Their production, modelling, &c., are difficult, and require time, and a description of the process would probably exceed the limits of a short paper. The crowns will be supplied by the dental depôts.

place. For fixing the entire crowns rubber rings may be used, or any means applied which may be deemed fit. For entire upper crowns it is advisable to drill cautiously through the mass (crown fissure), for the amalgam filling will more easily keep it in place, and counterbalance its dropping before setting ensues.

Special care is now needed for exclusion of moisture, for leaving no space between piece and tooth, and for saving the work from all unnecessary movement, on the part either of the operator or of the patient.

3. As the setting requires at least four hours, the patient ought to be requested to take that into account. After the lapse of that time, remove the paper wedge, and the finishing will be effected by lava strips drawn through the interspace upon the cervical part, and a circular brush dipped first into alcohol, and then in pumice stone powder. The best plan is to finish and polish five hours after operation on the same or the next day. Dissuade the patient from masticating on that side for two or three days. As to amalgam, any preparation may be used, even copper amalgam as a combination on the cervical border of the cavity, or alone. In the latter case at least eight hours would be required for setting.

If possible, and where a root filling has been effected, try to make a slightly conical angle on the approximal surface. The labial and lingual borders of the cavity will offer in that way a solid basis for the contour, which will easily bear the work of mastication. In cases where the loss of substance is much less the contour piece should be cut in an oblique line, corresponding to the ground-off surface of the tooth—the larger portion joining the grinding, the thin portion the cervical part.

If a small portion of the contour should happen to come away, this can be easily restored by the addition of some pits to the remaining portion.

Since the 15th of September, 1890, I have been using these amalgam crowns for contouring and crowning purposes in bicusps and molars where they were indicated. Here I give a list of cases :—

LIST OF CASES TREATED BY READY CONTOURS
AND CROWNS OF AMALGAM, SEPT. 15, 1890
—JAN. 24, 1891.

RIGHT SIDE.						LEFT SIDE.					REMARKS.
	III. Mol.	II. Mol.	I. Mol.	II. Prm	I. Prm	I. Prm.	II. Prm.	I. Mol.	II. Mol.	III. Mol.	
UPPER.			$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{3}$	...	$\frac{1}{3}$	$\frac{1}{2}$, $\frac{1}{4}$	I*	...	* Failure produced by omission of fixation while setting was going on.
		3** 4	...	...	...	...	...	...	...	...	** Same, plus hard friction by the cheek. Second trial again in vain.
LOWER.	$\frac{1}{2}$ $\frac{3}{4}$	$\frac{1}{2}$ $\frac{3}{4}$ $\frac{1}{4}$	$\frac{1}{2}$ $\frac{1}{3}$ $\frac{2}{3}$	$\frac{3}{4}$ $\frac{1}{4}$ $\frac{1}{2}$	...	...	$\frac{1}{4}$	I, I, $\frac{1}{2}$ $\frac{1}{3}$, $\frac{1}{4}$ $\frac{1}{4}$ *	$\frac{1}{4}$ $\frac{3}{4}$ $\frac{3}{4}$		* Failures by leaving a too hard bite upon the contour; repaired in 5 minutes.
			

The fractions mean restored portions of tooth-crown.

Models... 36
Soft Models ... 10

Total ... 46 Cases.

The cases here enumerated are too few, and the time for observation of the results is too short, to allow of my arriving at accurate conclusions as to their ultimate usefulness. But, there being no theoretical or practical objection to the admissibility of the operation, and as it offers great advantages to our profession, I decided to make it known for the benefit of my fellow-practitioners and the patients hitherto sadly exposed to the troubles, disfigurements, &c., inseparable from permanently separated teeth.

WHEN men make remarks in society meetings, "that all men falling away from manipulative ability will lean on plastic materials," it is time for us to speak plainly; for they imply that our use of plastics is a proof of our failure in manipulating gold, which is not a fact.

Dr. W. G. A. Bonwill, (Items of Interest).

INAUGURAL ADDRESS.*

By Mr. S. HUTCHINSON, M.R.C.S., L.D.S. &c.

GENTLEMEN,—I stand before you this evening with very mingled feelings—of pride and of fear ! I am only mortal, therefore the first sentiment is excusable, and, I venture to say, justifiable, for it would be but a poor compliment to you, and to the members of this Society, whose suffrages have placed me in this exalted position, if I did not express in the fullest way my heartiest thanks for the honour you have done me in electing me your Thirty-first President.

It has been quaintly said that “Vanity is merely respect for the good opinion of others,” and Narcissus himself was not more vain than I, if my vanity is to be measured by the respect I have for your good opinion !

I spoke also of fear, and that, perhaps, is almost as strongly developed as the other amiable virtue. Fear may be defined—though, perhaps, not in the dictionaries—as “a strong desire to be in two places at once.” You will see the appropriateness of the definition. One place, of course, is this honourable chair; the other—anywhere else ! At this moment, when I speak of fear, it is as a noun of multitude; fear lest I may not be able to give an address worthy of the occasion; fear lest this session may be deficient in mental pabulum; fear lest you have over-estimated my capabilities to worthily fill the position which it has been one of the ambitions of my life to occupy. And now that it is attained, I feel the responsibility of maintaining the prestige of this Society is a very heavy one. Fortunately, however, this responsibility is shared by the Council, and by the Society itself; and, with the strong Council and the energetic Secretaries, I can only hope that we may have a very interesting and instructive series of meetings.

It is here, at least, fitting to allude to the fact that the Annual Meeting of the British Dental Association will be held in London this year, and we shall have the privilege of welcoming our *confrères* from all parts of the kingdom.

The Metropolitan Branch of the British Dental Association has also been established, and we look with pride upon the

* Delivered before the Odontological Society.

new-born offshoot of the Dental Societies with the hope that its career may be prosperous, as it cannot fail to be if it follows the traditions of its parent and grandparent, and provided the strong leaven of *fin de siècle* is not allowed to predominate.

There is ample field for this new branch to discuss dental politics and ethics and new methods of practice, but I should be failing in my stern duty as your President if I did not express the hope that members of the Society, who are also members of the Metropolitan Branch, will present their scientific and other work before this Society.

Gentlemen, we do not want this Society to be the Odontological Society of London, but of Great Britain, and I trust we may have papers and casual communications from all parts of the kingdom as well as from London. It must always be a fact that this Society has the distinction of a *genius loci*, and its Library and Museum are the storehouses of the results of progress and contain the stepping-stones over which the science of dentistry advances, and while the Society attracts the picked men all over the country, it radiates the effect of their good work in equal proportion.

Donations to our Museum are always acceptable, and it is of the utmost importance that this museum should maintain its high standard of efficiency; and the marvellous display in Dublin in 1888 shows the store of valuable specimens in the hands of members of our Societies, and I trust the day is not far distant when all these specimens will find their way into our Museum. I should then be prepared to advocate the transportation of selected duplicate specimens on loan to every city or town where the British Dental Association may hold its Annual Meeting, so that in the first place a selection should be made by the Curator, and secondly that any donor should have the right of requesting his specimens to be lent to the annual meeting of the British Dental Association.

It is certain, of course, that a certain risk is run of breakage and loss, but I think a special case might be designed which would carry the specimens with safety, and with efficient organisation there is no reason why we should not follow the example of those gracious people who lend their pictures and other interesting valuables to Exhibitions all over the kingdom. Then we have our library; it is a very good one, but I do not think it is quite perfect—I should like our library to possess every single work on dental matters produced

throughout the civilised world in an orthodox manner, and I trust our Council will be able to adopt this policy through its librarian.

The advantage of specialism in scientific work is a point which is hotly debated, but whilst one could enlarge upon this topic, I must content myself with another definition of what specialism may be taken to mean. It surely means that it is the result attained by a liberal education being brought to bear upon the experience gained by constant practice of some department of study for which the individual has a natural or acquired aptitude.

To put it in another way, when a man has gone through a course of general study, he finds probably that the bent of his inclination leads him to pay more attention to one subject than the others, and it is obvious that if he works at this subject steadily—collects evidence of what has already been done—takes every opportunity of repeating these experiences, and of dealing with the matter in his own way surely the aggregation of these data must result in his being able to deal with, and, if necessary, to treat cases which fall within the scope of his training.

All this, no doubt, is very trite, but depend upon it that as time goes on and as civilization increases, specialism will cease to be a term of reproach and become the ambition of many earnest students in all branches of science. Surely the paths of literature may be taken as an illustration, when we find historians, poets, dramatists, novelists and journalists, usually sharply enough defined, and successful most when devoting their energies to one or other of these subjects entirely.

Darwin said : "It seems to me that an hypothesis is developed into a theory solely by explaining an ample lot of facts!" Gentlemen, may we not add to this—that theories become facts by the accumulation of instances in which theories are verified by their constant repetition in exact analogy,—and is not specialism the natural sequence?

Genius has been defined as the art of doing one thing superlatively well, and I think success may be defined as the art of doing everything rather better than is actually requisite!

Depend upon it success in life, whether socially or in the the exercise of one's daily duties, can never be secured in full if one only does just enough.

"To earn a night's repose."

The measure must be "pressed down and running over!"

It is interesting to look back to the last year or two to mark the progress which has taken place in our calling, and to note especially in its literature the new books and new editions which show the activity and energy ungrudgingly thrown into their labour by those who are endowed with the enviable gift of literary skill.

Then again, much good work has been done in the practical work, and it is remarkable that these efforts have been chiefly directed to the alleviation of pain in dental operations, and there is no field in medical or surgical practice more worthy of cultivation than the humane practice of our art.

We have fruitful and instructive discussions on anæsthetics, the introduction of gas and oxygen as a safe means of prolonged administration—further results in the successful use of bromide of ethyl. Then again, cocaine has been found by many to be capable of successful use as a local anæsthetic though the record of some difficulties make one reflect if it is as useful as nitrous oxide.

We have also had the record of experiments in hypnotism successfully tried for painless extraction of teeth, but I only mention this in order to offer an expression of my personal conviction that it is a method which should be employed—if employed at all—under the most stringent conditions, and with the greatest care. In fact I would almost go as far as to say that I do not consider that it is a legitimate means of securing immunity from pain, as it is inapplicable to a normally healthy subject.

I would endorse most emphatically the resolution passed by the Psychological Section of the British Medical Association in Birmingham last year, condemning the use of hypotism as a mere amusement, and calling for a committee of enquiry into its true nature.

I witnessed in Birmingham some very interesting and convincing experiments as to the possibility of reducing patients to the hypnotic condition, but the impressions they conveyed were those of humiliation, and extreme pity for the debased condition of the subjects whilst in hypnotic sleep. The conclusion I arrived at, after very careful observation, was that the mesmeric power could only be exercised by individuals upon a really small percentage of patients, and therefore this could not be available for all operators and all patients, so that the exceptional cases capable of this effect being pro-

duced, would not really be of any universal service, besides which one could not but ask the question, as to what will be the future condition of the patients, who thus allow their mental state to be abrogated at the power of a stronger will.

I do not for one moment doubt the potentiality of hypnotism, but I maintain most earnestly that whilst its effects may possibly be salutary in a few isolated cases, I consider that the state should only be produced in the presence, and with the full sanction, of a medical man, as well as that of the patient.

But still more strongly do I doubt the justifiability of hypnotism being exercised for the purposes of the operations in dental surgery, so long as we maintain the present average of success in use of nitrous oxide "gas."

The influence of the latter is purely toxic, whereas hypnotism calls into play both mental and moral phenomena, which are degrading to the patient and dangerous to the operator.

In taking this emphatically antagonistic stand, I trust I shall receive the support and countenance of my fellow members of the Odontological Society of Great Britain.

Before discussing the subject of local and general anæsthetics, I should like to emphasize again my faith in nitrous oxide, believing as I do that when pure, and administered skilfully, we are using the very safest and most legitimate means of mercifully sparing our patients the shock of painful operations, and with ether of course its effects are prolonged.

For the most serious and prolonged dental operations we have an auxiliary in chloroform, which we could not do without ; but it must be looked upon as a *dernier ressort*.

It is only right to mention that efforts are now being made to revive the use of Faradic electricity in securing painless extraction of teeth, but the experiments at present are in too crude a state to admit of their recognition. In the former use of this agent, the electric current was passed entirely through the forceps to the teeth, whereas the more recent method requires that the patient shall hold the terminals of the battery in each hand, whilst a third wire, attached to the handle of the forceps, diverts a portion only of the current through the tooth to be extracted, the circuit only being completed at the moment of extraction.

With the great activity manifested on all sides in the development of electric lighting, it is only natural that dental practitioners should eagerly avail themselves where possible, of this beautiful and healthful light, but so far the practical application of a mouth lamp is surrounded by difficulty.

It is essential to keep the light out of the eyes, both of patient and of operator, whilst at the same time the contrast between the light thrown into the mouth and that thrown on the instrument cabinet shall not be too great, for the sudden transitions from brilliant light to semi-darkness are much too trying to vision ; therefore, it is essential to strive for the double illumination. I have ventured to bring this evening a mouth-lamp which, in my own experience, has proved fairly successful, and I have much pleasure in showing it, in the hope that it may lead to further improvements in this very desirable direction.

Having so far glanced briefly at the modern literature of our subject during the last year or two, and at the means for alleviating suffering, let us now glance at the enormous strides which have been made in the use of the roots of teeth for carrying artificial substitutes. A more scientific knowledge of the power of antiseptic agents has rendered it possible to make healthy the roots of teeth which a few years ago would have been condemned as useless, but I should like to call attention to a book by M. de Chemant, dated 1816, which contains an illustration of an appliance carrying ten artificial teeth on a narrow plate, adapted and fixed by four pins fastened in the roots of four teeth.

Truly there is nothing new under the sun !

It is cheering indeed to watch the efforts which are being made to produce fillings and inlays for incisors which shall imitate the natural colour and consistence of the natural teeth, rather than disfiguring them by elaborate and extensive displays of gold ; and the inlays of ivory, of porcelain, and of glass seem to indicate that in the near future we shall have a most natural, lasting, and artistic means of treating extensive caries in incisors, canines and bicuspid.

Mention has been made of the progress of antiseptic dental surgery, and it is not necessary to dilate upon the details of the various agents which may be used in carrying out this most desirable method of practice, as so much has been written to such good purpose on this subject.

I would, however, ask the members of this Society to give their attention to the use of oxygen gas in the treatment of septic roots and of alveolar abscess, as I have made a few experiments which seem to indicate that we have in oxygen gas a therapeutic agent of the greatest value as an oxydising agent. I find it is possible to use the compressed oxygen now so easily obtainable, by fixing a small india-rubber tube to a small expansible net-covered bag at the outlet of the gas bottle, and slipping the india-rubber tube on to the nozzle of the injection needle of a hypodermic syringe. In this way it is possible to use pure oxygen in a variety of ways in the treatment of roots and abscesses, but my experience so far has been small, and I trust the idea may be carried out experimentally by those to whom the suggestion may commend itself.

Our Society very justly taboos political discussion and controversial matter, but it would not be fulfilling the object of its initiation if we failed to be interested in dental education.

The recent alterations in the curriculum afford much scope for reflection, and a quotation from the first introductory address ever given before the Society makes us ask ourselves whether its aspirations have been realised.

The late Mr. Cartwright, in 1856, said :—" It cannot be doubted that a liberal education is of the greatest value to those engaged in practice ; and the more education is extended in all ranks of society the more it becomes necessary that the members of our profession qualify themselves as highly as they can ; for those who employ the services of the dentists in these days have a right to look, and do look, to the qualifications of the mind, as well as to the mechanical adroitness of the fingers."

Then again Mr. Cartwright said of the dental diploma : " A recognised connection with the College of Surgeons is best calculated to raise the status of the dentist to an equality with other medical practitioners, and rescue our profession from the anomalous position it has hitherto held. It is my opinion," said he, "that any attempt to separate dental surgery from the profession of surgery is impolitic in the extreme.

" By allying ourselves to the parent institution, the College of Surgeons, we must hold a proper position as professional men, while our status, I think, could not but be lowered by

any scheme which involves a voluntary separation from that body."

Now, gentlemen, we must admit that Mr. Cartwright's views expressing, as they did, the opinions of those who gained for us the charter granting the L.D.S. diploma, have in great measure been more than realised, and it is in our hands to maintain the prestige of that diploma, and by constantly raising the standard of the curriculum and examination, in harmony with medical education, we shall best be carrying out and emphasising the policy laid down for us in those early days.

I find amongst the names on the Council of the Odontological Society in 1856 those of John Tomes, Edwin Saunders, Thomas Arnold Rogers, Samuel Cartwright, G. A. Ibbetson and Henry Barrett, and we cannot but feel our hearts beat in unison with theirs in the exaltation they must feel in their well-won victory, the L. D. S. diploma.

As to what must be our future course, and what we must do to enhance the value of our inheritance, I do not venture to propose on this occasion; I can only earnestly and sincerely as President of this Society offer to these gentlemen and others who worked with them, an expression of our gratitude and appreciation.

Glancing over the records of this Society, and of the scientific and literary work done by its members, we have just reason to be proud, and we have a stimulus given us to carry on the good work, and I am not one of those who consider that the "Caucasian is played out," as far as the scientific aspect of our profession is concerned. There are many problems yet to be solved, and I look to the army of highly-educated and accomplished junior members to do much good work, not only with the microscope, but in the accumulation of facts in anatomy, physiology, surgery and pathology, metallurgy, and mechanics.

There is ample scope for further research in regard to the direct and remote influence of nerve-irritation and nerve-sympathy caused by dental lesions, especially during the eruption of the deciduous teeth and the third molars, such as the prevalence of grave mental and physical morbid phenomena such as convulsions, epilepsy, hystero-epilepsy, and other disturbances. There is also much unknown with regard to the prevalence of caries during adolescence, its causes and

treatment ; then again, the prophylaxis of caries is still far from being a scientific certainty.

We do not know much about the physiology of nerve sensation in tooth substance, and we can at present only theorise as to the zone of pain at the point where the dentine joins the enamel. We are profoundly ignorant as to the true function of the soft fibrils in dentine, and we cannot state with certainty whether any change or none, either of deposition or alteration, takes place in dentine after the complete formation of the tooth.

We are obliged to say that we do not know the exact *modus operandi* of such an apparently simple matter as the growth and eruption of a tooth.

There is a fruitful field for observation in the possible relation of skin diseases with dental caries, and the influence of dental disease on strumous glands wants working out.

We are still inventing fresh explanations, without explaining the true etiology of erosion, and when we say that the soft fibril of Tomes is a mass of protoplasm, possessing all the attributes of that organism in other parts of the body, we are only confessing the utterness of our impotence.

Turning to our practical work, we have not yet discovered a filling possessing the colour and texture of a human tooth, which shall be as lasting as gold and amalgam, and in the workroom we cannot find out a substance possessing the beauty of so-called continuous-gum, which shall be as easily worked as vulcanite.

So, gentlemen, it seems only too obvious that, as soon as our student days are over, we must begin to learn, and I maintain that the value of an extended education is proportionate exactly, in so far that it only teaches us how to learn. And this is why I am so earnest an advocate of the dental student taking the conjoint diploma and the Fellowship, whenever it lies in his power, for it simply teaches him how to learn.

There is one subject to which I should like to allude, and that is the establishment of a gold medal to be awarded (after examination and under certain conditions) to the best student in the United Kingdom from any of the Dental Schools, and the name by which that medal shall be known is one which, I am sure, will rise to every lip, and that is the "Sir John Tomes' medal !" Then again, gentlemen, there is a topic which is of too controversial a nature to discuss in this address, I

mean the proposed higher diploma in dental surgery, but I, for one, should welcome the day when every qualified surgeon would regard membership of this Odontological Society as a higher diploma, to be obtained only as the results of some good and original work, and of probity in private and professional life! If need be the hall-mark of royal recognition might be sought, so that the members might be entitled to the proud string of letters after their names—of L.D.S. and M.R.C.S.!

MECHANICAL DENTISTRY AND THE LAST LONDON EXAMINATION.*

By Mr. D. W. PARSONS.

Mr. Chairman & Gentlemen,—There appears to be a new phase developed in the Examination for the London “L.D.S” viz :—the introduction of Mechanical work.

It was in the report of the *Dental Record* of Dec. 1890, that I saw the particulars of the above mentioned examination. A fully fledged L.D.S. who had evidently been reading the same journal, casually remarked that he had never fitted down a tube tooth, this having been required of one of the candidates. It is a well known fact, that as soon as the Student becomes initiated into the fascinations of the operating room, he seems to thoroughly despise, and avoid the more plebian occupation of the work-room. Again, many Students have been articled to registered practitioners, thereby fully complying with the regulations of the separate Colleges, yet in whose practice perhaps they may never have had the opportunity of acquiring the manipulative skill, and extreme nicety of touch requisite for tube work and other branches of high-class dentistry. Lately we, the students of the Liverpool Dental Hospital, have watched with interest the arrival of sundry articles of the work-room, for the purpose of fitting up a work-room for the use of the Students. Is this for the purpose of instructing us in this branch of our profession, and if so, who is to be our professor, or instructor?

* A paper read before the Students' Society, Dental Hospital, Liverpool.

Should such be the case, with what a great amount of confidence, we shall be able to present ourselves to the examining board, and carry the banner of our Hospital, (whose motto then ought to be "Excelsior") triumphantly through all obstacles, whether Mechanical or Operative.

Again, the student who comes forth from the work-room of a high class practice, in fact, one who would hardly deign to soil his hands other than by the handling of the king of metals, might well be posted up in what might be called "field dentistry"—viz.:—the prompt repairing, or perhaps a better term would be patching up of dentures, whether metal or vulcanite. This to a certain extent would be a departure from his ordinary work, and such a task might confuse him, and thereby upset him for that part of the examination in which he should shine forth in brilliant colours; while had he devoted a *little* (mark the adjective please, gentlemen) time and study to this style of work, he would perhaps have gone through the mechanical part, at least, of his examination without a ruffling of his feathers.

Let us return to the subject of tube teeth. We hear on all sides, that this class of work is falling out of fashion. Why should this be so? Is it on account of its not being so strong as backed teeth? Some will answer yes, while yet others say the reason is that the teeth take too long to fit. These arguments, gentlemen, in my humble opinion, will not stand the fire of criticism. Let us treat of the former objection first. The teeth are supposed to be weaker than backed teeth. This I hardly think correct, for when a tooth is fitted "perfectly" to the plate and the opposing bite, it, by reason of the support it gets from the pin, receives all the antagonistic force on its strongest axis, viz.:—a line drawn from the centre of the crown to the base of the tooth, and this is just the part strengthened by the pin. As regards backed teeth all the *metallic* support is derived from the soldering of the back to the plate, thereby receiving the opposing force at an angle which greatly minimises its resisting powers.

Now for the second objection.—"Tube teeth take too long to fit." Every one will admit that to fit down a tube tooth, is no child's play, yet "practice makes one perfect," so the saying goes, but if one compares the fitting of a tube molar with that of a plate one, the work is not much greater, or should not be. Unfortunately, there is a custom very prevalent in work-rooms of fitting the buccal surface passably,

and then filling up the space at the back with bits of platina pins or wire. Can this be called good work? Yet often such is sent out from good practices, the solder being well flushed over the backs and polished smooth, the case is to all appearances perfect. The whole of the base of the plate tooth should touch (and thereby gains support and strength) the plate the same as a tube tooth. I plead guilty of having done this myself in former days. Again I have known sulphur being used to fill up these gaps in the case of plate teeth as well as tubes. How provoking it would be if one tried to use pins at the exam. and after taking the piece out of the plaster to find the buccal surface risen or tilted from the plate; yet this is a common result of such practices.

As regards soldering, every student should be able to use either the mouth or foot blow-pipe, for one does not know which he may be required to use in London. To a man who has constantly used the foot bellows, it would be extremely embarrassing to have a mouth blow-pipe handed to him. It requires considerable practice to be able to keep a continuous blast on your case and to avoid missing the flame and consequently sending a blast of cold air on to the teeth which in all probability would result in cracking two or three of them. Again the foot blow-pipe, in inexperienced hands, may easily result in the melting, not to say sweating, of a gold denture. As regards the soldering of the gold crowns and collars, this is a luxury that not very many of us have had the pleasure of revelling in. I recollect one of our esteemed professors using very unparliamentary language during this interesting performance, needless to say, this might have a very pernicious effect on the sensitive ears of the austere London examiners, for I well remember the shocked expression that came over the faces of the students standing round.

I see one thing required was the cutting off of a clasp, and resoldering it to the plates. This I suppose all will say is very easy. I quite agree with you all, gentlemen, yet how often do we not see great lumps of solder stretching from the plate to the clasp! Again, has it never occurred to any of you here present, even those fully equipped in the war-paint of our profession, that after carefully fitting a clasp to find after soldering it, the fit is not nearly as close as before. What was the reason? Either the careless handling of the plate when the clasp was only waxed, or else the cutting away of too much of the plate and the soldering causing the springing

of the band slightly (perhaps) towards the plate. It would be impossible to even touch on all the possible mechanical things one might be asked to do in the examination, but just a remark about the malleting of a plate, a task one might very easily be requested to perform. To my mind too little care is given to this stage of plate striking up. I think it is extremely hard to mallet your plate in such a manner so as not to split it, especially when the palate is very high or when the space between some standing teeth is rendered an absolute undercut by the tilting of the tops of the teeth across the intervening space. Nothing else but great patience and gradual working down of the palate will prevent it splitting right across. It is by far the best to get your case somewhat of a fair fit before putting in between your zinc and counter die, and even then starting your hammering with very gentle blows, and constant annealing. Like they say of a good dissector. "Half of his time should be spent sharpening his Scalpel," so should a great deal of the good mechanic's time be spent in annealing his plate.

The making of metal lowers where the incisors and canines are standing is one of the most difficult things for a mechanic to do. There is nearly always a great ridge standing out at the internal alveolar edge which renders the casting of the model a very difficult, in fact almost an impossible, task. I for my part always cast first what is called a core. Make the model as smooth as possible, then take some thin tin foil and cover the inside of the model, pressing the tin very closely to the plaster; then take flour and casting sand in the proportion of 20 of flour to 100 parts of sand, mix these well together first day, then moisten the mixture slightly to about the same extent one would ordinary castings sand and press it well on to the model with the fingers, bury a piece of strong wire in it, leaving a piece standing out at the back as a handle if you like, then fill up to the top of the undercut only, then when this is firmly pressed together (leaving no bits overhanging) draw it out in the antero posterior direction of the mouth, or, in other words, draw it out at the back, and then place the core in the oven until it is baked perfectly hard and dry. (Two or three should be made, in fact a fresh core should be used for every zinc casting). When dry, place the core (having cut off the handle at the back perfectly level with the sand) in the model and then cast in the ordinary manner; the undercut will lift out the core when the model

is taken from the sand, it can then be removed from the plaster from behind and placed back in the sand, and then the zinc poured in. The casting when cool will require very little trimming and the undercut will be found almost perfect. This only requires a little practice to produce an excellent model.

I have endeavoured to cast two or three cores and also a zinc model and counter. I hope, gentlemen, in these you will only look at the part in question, viz: - the undercut, as I had not much time to devote to the minute casting thereof. I, for my part, always make two thin plates, say two number 4's, leaving one slightly larger than the other, place the one under the other and solder the two together, the combined plates together with the solder, equal about a number 10 plate, some prefer the under plate to be slightly thicker than the top one, this is a matter of taste.

I have been asked by our esteemed Secretary to allow brevity to be one of the prominent features of my paper, so I must stay my pen in its hasty race across these pages and ask all to bear well in mind this paper is but the attempt of an embryonic dentist, and, gentlemen :

“If I have chanced to fall below
Demosthenes or Cicero
Do not view me with a critic's eye,
But pass my imperfections by.”

A CONVENIENT HELPER.—When inserting a gold filling in the teeth, it sometimes happens that the under wall has not been built out enough, and gold must be added from the under side. By slipping a matrix of thin steel, such as ribbon-saw material, between the proximate surfaces, the gold can be welded much easier, with less liability of chipping the tooth enamel.

Ohio Journal.

British Journal of Dental Science.

LONDON, MARCH 16th, 1891.

THE JOHN TOMES' GOLD MEDAL.

WE have often, before now, urged the Odontological Society to follow in the footsteps of the British Medical Association, and to make grants in aid of Research Scholarships. We do not, however, quite like the idea, mooted in the President's opening address, of founding a gold medal for the best student of any of our Dental Schools. That is to say, if by student is understood a man of not more than two years standing. We have every sympathy with the Schools, and scholarships are needed at these, but we do not think professional knowledge would be much forwarded by such a step as this. The primary duty of the Odontological Society is to further this professional knowledge, it does so in many ways, and might do so in more. We are bound to say, and we do so freely, that it distributes its blessings in no narrow spirit, but in a liberal manner, as freely to its non-members as to its members, but, surely its interests and its work more lie with practitioners, than with the students (using this word, as meaning unqualified man, attending the schools). These latter are, with perhaps some few exceptions, engaged in picking up the rudiments of their science and art, and if incentive be needed for this, have they it not in the class prizes, and in the obligations to pass their qualifying examination. They have no time to devote to original work, nor have they the knowledge, which would enable them to do so in a thoroughly scientific manner. Surely it is original work and thought,

in whatever direction, that the Odontological Society wishes to forward. Now, there appear to us several ways in which it could do this.

1. We think, much stimulus might be given by a gold medal as suggested by Mr. Hutchinson, and certainly no name could be more fitly associated with it than that of John Tomes, a man whom it delights us to honour. But this medal should be awarded to the best who presents himself, whether qualified or unqualified, old or young. It should be a great reward, for a great race, needing much preliminary training. If a type be needed, in which to mould it, might we not suggest the Jacksonian Prize at the College of Surgeons.

2. There can be no doubt that much good has, and does, result from travelling scholarships. The world is the great hunting-ground, and a much richer harvest may be garnered in therefrom than from one little land, however prominent in intellect and energy. In other lands, there is so much to be learnt and seen of a professional, as well as of a more general nature, that a man's education can scarcely be said to be complete, if he has not at least sought out these sources of knowledge. Unfortunately, comparatively few have the means at their command to follow this course. The more welcome, therefore, are such scholarships as the Radcliffe at Oxford, the Pugin, at the Society of British Architects, and many others. A year or so at the conclusion of a student's course of study at home, if devoted to further work in other fields, will usually give ample reward to the man himself, and through him to the Profession.

3. The last way in which a Society, such as this, can help on original work, is by placing means and materials at the disposal of the worker. There are many ways in which this can be done. A perfect library and a museum are essential; with these we dealt in a previous issue. Another way is by pecuniary aid towards a definite line of experiments, and a third, is by providing lectures, laboratories, &c. We have so often dealt with the subject of the need of a Dental Laboratory, that we need hardly refer to it here again. Sooner or later it must come; meanwhile we cannot but deplore its

absence, for the years roll by while the authorities sleep, and generations of students, possible workers in the field of research, drift off without ever having had their hand put to the plough.

During February the election of the Dental Board of Victoria has been taking place, but the results are not yet to hand. The board consists of eight members, four of whom must be registered dental practitioners, and three legally qualified medical men. On the passing of the Dental Act in 1887, the board were appointed by the Governor-in-Council, their period of office has now expired, and in future members will be elected by vote. A large proportion of those practising Dentistry in Victoria are also pharmacists. On the last board these pharmacist-dentists had only one representative, the remaining four being pure dentists. The Council of the Pharmaceutical Society of Australia are, however, of opinion that the representation is insufficient, and they have nominated a Mr. Reeve to be co-candidate with the present member, Mr. Potts. The Society justly recognize that dentists pure and simple should have the stronger numerical representation on the board. There is no friction between the two sections, but friendly co-operation. It seems to us that no exception can be taken to the action of the Pharmaceutical Society in this matter. As long as men are allowed to practise Dentistry conjointly with Pharmacy, so long should such men receive a just representation on the Dental Board, and this is the more true when such pharmacist-dentists are in the majority. Turning to the question whether the co-mingling of two distinct callings is wise or desirable, we open up a very much larger question. Without arguing it at all, we may say we do not think it is. There is quite sufficient in either calling to constitute one man's life-work. A Jack-of-all-trades is proverbially master of none. No doubt in a new country like Victoria, with vast areas of scantily populated country,

specialism is uncalled for, indeed impossible. We can only hope that educational influences will be sufficient to ensure a firm grounding in the rudiments of our Art.

The McKinley bill appears to have had the effect of altogether putting a stop to the sale of English made teeth in the States. Messrs. Ash & Sons have addressed a circular to the Dental Profession announcing that on account of the duty on plain pin teeth being raised from dols. 17.50 to 52.50 per 1,000 they are unable for the present to make any further shipments. Wholesale orders cannot therefore be executed, but the profession will be supplied as long as the present stock lasts. The circular then closes with a little homily, but one in somewhat ambiguous terms, it says :—

“Many of the profession are fully aware that our London house and all its branches have been liberal buyers of American dental manufactures. And, for reasons that need not be mentioned here, it would have been in the best interests of the profession if the preëxisting high rates of duty had been lowered instead of raised. They will also readily understand in whose interest this increase has been made.”

We are afraid we cannot offer any solution to the different conundrums therein propounded. But if it means this firm will supply us with articles of English manufacture, which we now have to obtain from foreign sources, then McKinleyism is a blessing in disguise.

Meanwhile we note that though this firm has branches in seven different countries it has not one in any of our colonies. This will strike most as somewhat curious, though, of course, each man knows his own business best. Still we notice that a large firm of wholesale druggists in Melbourne have judged it worth while to set aside a large portion of their premises for dental instruments and appliances, and have stocked them largely, it is said, with goods of Messrs. White's manufacture.

Abstracts of British & Foreign Journals.

THE FRENCH DENTAL JOURNALS.

L'Odontologie for January begins with an article by M. Paul Dubois, on ENAMEL FILLINGS. For a long time, he says, I have done fillings by means of pieces of mineral teeth, and fragments of porcelain prepared beforehand; two years ago I made some trials with enamel fusible, at a low temperature, and for that purpose I possessed samples varying in colour. The publication of Richter's efforts, made me resume mine, using William's platinized gold to obtain the impression of the cavity, and to my great satisfaction I found I could obtain with the enamels sold in commerce at low prices, fillings perfect in appearance, solidity, and ease of manipulation. Instead of the grinding of special kinds of glass advocated by Herbst, instead of using powders prepared beforehand, which had to be carefully filled into the cup of platinized gold, instead of the repeated firings, I obtain with these enamels at one firing over an ordinary Bunsen burner the fusion of my piece of enamel, and in a few minutes the filling is complete. The method M. Dubois adopts is as follows: The cavity being prepared without groove or undercut, he takes Williams' Platinized Gold No. 60, cut into small pieces about half an inch square, and notches it with fine scissors to facilitate its folding and prevent tearing the gold. It is advisable to render it concave with the handle of an instrument before commencing to mould it into the cavity. Then holding it in place with an instrument, it is burnished into the cavity, using cotton wool under a burnisher in preference to an unprotected burnisher. It is not essential to have a perfect impression of the floor of the cavity as cement fills that up, but the edges must be perfect. The cup is then carefully removed, filled with little pieces of enamel coarsely ground. The enamel becomes plastic, and adapts itself very well to the shape of the gold cup in the flame of an ordinary Bunsen burner; it remains plastic a few moments, and can be worked, if necessary, with a hot spatula. When the inlay is ready for mounting, M. Dubois prefers to hold it by dropping a little sticky wax on the face, and picking it up with a plugger, in preference to

trying to hold it in conveying forceps. Before fixing it make grooves in the cavity. If the cavity should have marked undercuts, fill them with gutta percha, before moulding the little gold cup.

The possibility of fusing enamel off hand, will receive other applications, and for metal plates, for instance, it will often be possible to hide the metal under an enamelled surface.

Dr. Etchepareborda of Buenos Ayres, sends a letter to *L'Odontologie*, describing some of the characteristics of the skulls of the native Patagonians and Bolivians. The skulls, he says, in the Museum of La Plata are mostly dolichocephalic, the maxillae are well developed and the dental arches regular. In a few cases, the crowding of the teeth has caused the projection of the canine, which gives a rather square form to the jaw. They are mostly prognathous. The form of the teeth, their size, the number of cusps, and number and shape of roots do not differ from these of European type. Some authors have asserted that in the lower races, the wisdom tooth is equal in size to the other molars, or even increasing from first to third, while in civilized races the molar series decrease in size from before backward. I can affirm, says Dr. Etchepareborda that neither in the fossil skull found side by side with the seclidotherium in the province of Buenos Ayres, nor in the crania exhumed from the cemeteries of Patagonia, nor in the mummy found in the cave of the Lake Argentine, the source of the Rio Santa Cruz, nor in a thousand other skulls examined, are the wisdom teeth so large as the first or second molars. Mechanical abrasion is very common and even marked in very young subjects, from the disappearance of the cusps to the complete destruction of the crown. I have found, he says, in the prehistoric skulls another form of erosion which deserves special mention; it consists of a smooth polished depression in the biting surface of the first upper molar, sometimes extending to the neighbouring teeth about the size of a half of a cherry-stone.

In the pre-historic skulls he found no trace of dental caries: in the more modern types it is also rare.

The negroes in Buenos Ayres have bad teeth, very prone to decay, white in colour but without any power of resistance.

L'Odontologie publishes the following statement from Mr BOUCHARD, at Lille, whose patient died recently after having had teeth extracted under cocaine :—

Mdlle. X. came on the 7th August to make an appointment for the next day. I then proceeded to extract two upper teeth after having previously injected a one per cent. solution in three places two inside and one on the outside. The teeth, were very loose, and the success of the operation was complete. After a few minutes, the patient expressed a desire to have a third tooth extracted, situated on the left side of the lower jaw, and as loose as the others ; I injected the rest of the cocaine contained in my syringe, and after waiting a few minutes I removed the tooth ; I gave the patient some warm water, and a little black coffee to pull her together. There were no indications of any untoward incident ; the patient appeared very comfortable, though a little excited. I left her in the care of her uncle and went to get some coffee. On my return I found her in a faint ; I put her on the floor after having loosened her dress and corset. I used friction, cold water &c., in a word, all that is usually recommended. Doctors called in haste, adopted the same measures, they tried also injections of ether, gave nitrite of amyl, and oxygen, but all was useless, and the patient succumbed after half-an-hours' fruitless efforts.

The doctor commissioned to draw up the medico-legal report, after having described the state of syncope of the patient, declared death to have been caused by cocaine, that drug having been employed.

Did the cocaine cause death ?.....I intend to prove the contrary.

When the worthy doctor accused the cocaine, he like myself, was ignorant of the fact that a thick band—called a washing band,—went four times round the patient's waist, compressing the thorax ; this band was so tight, that it could not be cut off without cutting the skin. This explains why the attempts at artificial respiration proved useless.

On the same subject *Le Progrès Dentaire* speaks as follows under the heading "DENTISTS AND COCAINE":—The Tribunal of Lille has just pronounced in the case of the

dentist Bouchard who was held responsible for the decease of Mdlle. Delcambre, who died immediately after the extraction of a tooth, after having had several injections of cocaine. The Tribunal has acquitted the dentist of the charge of culpable homicide. But M. Bouchard has been fined 15 francs for illegal practice of medicine, inasmuch as in injecting cocaine on the 8th August, on the person of Jeanne Delcambre without having a diploma, he contravened the law of the year XI. on the practice of medicine ; that cocaine is an anæsthetic the use of which demands great care, and should only be employed by doctors.

One cannot help remarking that if this decision be established, dentists will be in an awkward position, for the use of cocaine is so general that most dentists employ it. In this particular case it is certain that the cocaine had nothing to do with the death, while it was the operation of extraction which caused the fatal syncope. Moreover the dentist was only prosecuted for the use of cocaine, and not for the operation. There results this paradoxical fact that to inject cocaine, which is harmless, without a diploma is punishable, whilst to perform an operation which may cause death is not culpable. We have here a caprice of the law which creates a difficulty it is not easy to overcome. In the same way, strictly speaking, a dentist has no right to use antiseptics since he may not prescribe them. A remedy is proposed for this state of things which we consider impracticable, and which consists in demanding a diploma of Doctor for every dentist. But without going further, something may perhaps be done to improve a position more false for the dentist than for those who have recourse to his services.

L' Art Dentaire narrates the following case as illustrative of the rôle of teeth as criminal detectives :—A cigar-holder was found near the body of a person murdered in his own office, after the departure of his employés. It was broken in half, but the amber tip was intact: It was at first supposed that it belonged to the banker himself, especially as it contained the remains of a good cigar. On examining it, the juge d'instruction noticed two marks made by the smoker's teeth, the one much deeper than the other. These two indentations did not correspond however to the teeth of the victim,

and hence the cigar-holder must have belonged to the murderer. In the course of the investigation the judge had to receive the statement of a cousin of the banker's, who had been at the house on the day of the crime. While listening to this witness, the judge noticed that his left incisor was somewhat shorter than the next tooth. He politely asked the witness to try the cigar-holder; the latter turned pale and refused. The judge compelled him to undergo the test; the two teeth of the man fitted exactly to the two indentations in the amber mouthpiece. The assassin was found!!

TIC-DOLOUREUX.

Dr. C. L. DANA (*Journal of Nervous and Medical Disease*, No. 1, 1891), while admitting that inveterate trigeminal neuralgias are usually caused by local disease, such as exostosis, aneurysm, syphilitic growth, contends that the ordinary cases of tic-doloureux occurring after middle life, and affecting chiefly the second branch of the trigeminus, have so much etiology. The absence of permanent anæsthesia convinces him that neuritis and nerve degeneration must be excluded. On the other hand, in cases of progressive trigeminal anæsthesia, due to the degenerative neuritis, there is but little pain. The following facts lead him to the belief that in many cases an obliterating arteritis of the nutrient vessels of the nerve is the cause of the disease in question; 1. The disease occurs only at the time of life when arterial degeneration commences. 2. It affects primarily and chiefly one of the terminal branches of the internal maxillary. 3. If it extend, or recur, it involves the inferior dental. Rarely is the supraorbital nerve, which is nourished by a branch from the internal carotid, seriously affected; hence it follows a certain fixed vascular distribution. 4. Examination by him of four superior maxillary nerves removed in typical cases of tic-doloureux showed absence of noteworthy change in the nerves. In three of them, striking evidence of arterial diseases was found. In the fourth case no blood vessel was present in the specimen. 5. Therapeutical experiences favour the theory. Nitroglycerine sometimes relieves pain instantly, and for a prolonged period. Aconite, which so useful in this disease,

also lowers blood tension. 6. There is unquestionable evidence that removal of the peripheral, nerves sometimes cures tic, consequently the disease is peripheral, and due to some local peripheral irritation. 7. By a new method of injection certain authors have discovered a closer and more extensive relationship between the nerve trunks and bloodvessels than was hitherto known, suggesting that disturbance in blood supply may be an important factor in the causation of neuralgia. Even in old and typical cases Dr. Dana found the trigeminus, with its roots and nuclei, free from disease. In all cases where the blood vessels were examined they were obviously diseased. His argument is defective in that he has not examined the infra-orbital arteries of healthy persons from 40 to 60 years of age, but he considers it safe to assume the most of those typical cases of tic, occurring after middle life, are due to arteritis obliterans of the infraorbital or inferior dental artery—terminal branches of the external carotid.

British Medical.

THE ART OF EXPRESSION IN ITS RELATION TO PROSTHESIS.

By Dr. J. H. WOOLLEY.

After the student in dentistry has devoted sufficient time to gain a knowledge of surgical, or, topographical anatomy, pre-supposing the aid of the dissecting-room, his studies should be directed to the Plastic Art. The best results attained are by following closely certain methods known in the sculptor's art. The simplest and easiest is that of direct experience; the modelling of a bas relief or entire head.

The first step necessary is to mould the clay in an oval form, its greatest diameter being the facial line, *i. e.* the line from the top of the forehead to base of chin, and divide it into four equal parts.

- 1st. From the top of the head to the roots of the hair.
- 2nd. Thence to the root of the nose.
- 3rd. Thence to the bottom of the nose.
- 4th. Thence to the bottom of the chin.

This last part, divided into two equal parts, will determine

the bottom of the under lip. And if the upper portion is divided into three equal parts, the upper line will give the boundary of the opening of the mouth, the second line will determine the depth of the upper lip, the third line the space between the upper lip and the nose. The width of a lip from the point to the under lip will give the beginning of the chin.

The ear is equal in length to the nose and parallel to it.

The width of the eye is one-fifth the length of the nose.

The space between the eyes is equal to the length of an eye.

There may be in some cases a deviation from these general rules, but they are a few of the fundamental or basic principles upon which the art of expression rests. They also serve to give a few hints regarding the first principles of portraiture in clay.

Robert S. Ivy, in the treatment of the subject of prosthesis, refers to the art of figure-drawing as a great aid in getting the true proportion of the face. But in the restoration of its last curves and angles, judgment is required, as also observation of a human face in profile. I should go farther and say this judgment is reached by modelling the face in clay from the antique, or life ; for it is due to this alone, that we learn to understand its composition.

When the teeth have been removed and poorly adapted substitutes fitted, the muscles that control the mouth are misdirected, and produce a strained and unnatural expression, and we are at a loss sometimes to know wherein lies the chief difficulty.

Before proceeding to the restoration of that organ to its natural shape and condition, we have to study and first determine as far as possible its character.

Mantegazza considers the face from five different points of view and calls them the five different problems.

1. Condition of health or sickness.
2. Degree of beauty or of ugliness.
3. Moral worth.
4. Intellectual worth.
5. Race.

These five problems lead to five different opinions which we can form on the face of a man and which he calls

1. Physiological judgment.
2. Aesthetic.

3. Moral.

4. Intellectual.

5. Ethnic.

Now as dentists we can study these five problems.

By means of the Aesthetic we seek to give the mouth its highest form of beauty, not a shape that represents sensuousness and a low form of animalism and meanness or stupidity, or weakness, unless these qualities belong to the individual.

If the individual is a person of culture, good morals and intellectual strength we should not give to this mouth the same expression we would to Bill Sykes.

Our opinions being formed as to these five problems, we proceed carefully and systematically. The first thing being necessary is to secure a good impression, which should be taken high up on the ridges of the mouth, that the plate may be made correspondingly high on the ridge, for to this alone is due one of the essential principles of success. A trial plate of gutta-percha should then be made for the base plate, upon which to place the wax for an articulation, care being taken at the same time, to get the length of the teeth, and form the expression of the mouth, both in its contour and front.

We are enabled thus to secure the proper length of teeth. It is supposed our knowledge of physiognomy will teach us what exaggerated effect is produced on the face, either by using teeth that are too long or too short. If the former, the mouth will take on the appearance of increased age and also in some degree change the enunciation. If the teeth are too short, the appearance of the mouth will be that of stubbornness, pertinacity and aggressiveness that might be entirely opposite to the character of the individual.

Having determined the proper length of teeth, we proceed to make articulation upon which to arrange them, being careful to preserve the outward form of the wax in the mind's eye to aid the operator in the arrangement before they are tried in the mouth. Additional advantage can be gained by studying the facial expression of the patient from a photograph taken before the extraction of the teeth. We shall then have some guide to the original shape and expression of the mouth.

Now, with a well-defined idea of the general form of the face from its different points of view and analyzing its meaning, we shall then be better prepared to execute the task before us.

Few definite rules on this point can be given, but a certain amount of the skill acquired becomes intuitive.

The dentist who has modelled in clay cannot help but acquire a certain degree of the unconscious skill that sculptors possess.

The Dental Review.

ARISTOL.

Aristol is the name of a new antiseptic introduced to take the place of iodoform, idole, and zozo-idole. Aristol is prepared by Farbenfabriken, Elberfeld, Germany.

Aristol is a kind of powder, which when rubbed in the hand feels like a resinous powder ; being rather sticky it adheres to the flesh easily. Its colour is an approach to the salmon colour, and is comparatively inodorous. The freedom from disgusting odour like iodoform will make it a welcome visitor to the dental office which should not smell like an apothecaries' shop.

Aristol is a combination of iodine and thymol and is said to be very valuable. It retails at about two dollars per ounce, but weighing lightly, a small quantity will last a long time. Sixty grains will easily dissolve in one-half ounce of ether.

Perhaps the best way of using aristol is, make a solution of it in ether of chloroform, both of which readily dissolves it, and as an antiseptic, dressing it can be easily introduced, in that state, into root canals previous to filing.

Aristol is insoluble in water and will not easily dissolve in alcohol.

Oils containing fats will dissolve it. Heat will decompose aristol ; so it is best to use it after the tooth has regained normal temperature after using the hot-air syringe.

This antiseptic may be especially recommended to the dental profession in the treatment of the results of actino-mycosis. It will not irritate, and is not poisonous.

The drug should be kept in dark-coloured bottles, and only small quantities bought at a time, so as to insure freshness.

Dental Register.

A NEW METHOD OF MAKING DIES.

Dr. Theo. F. Chupein, of Philadelphia, editor of *The Dental Office and Laboratory*, suggests a method by which a lead counter-die can be used in connection with a Haskell babbitt-metal die. As is well known, the babbitt-metal melts at a much lower temperature than lead, and if an attempt is made to pour lead—however chilled it might be before pouring—on a babbitt-metal die, the two will adhere. To overcome this annoyance, Dr. Chupein uses a Lewis moulding flask. The cone-shaped top is inverted and filled with sand; the thin plaster cast—having previously been *thoroughly* dried—is then laid on it, the ring put in place, and the lead poured in. When the lead is cold, the plaster model and sand are removed, the flask reversed, and the babbitt-metal poured into the lead counter through the cone-shaped orifice. In short, this method is reversing the usual way of making dies and counter-dies, and will save considerable trouble in overhanging models, where it becomes necessary to make cores in order to draw the model out of the sand.

Dental Advertiser.

M. MORELETTE, a well known French scientist, states that vulcanised rubber dipped suddenly into boiling glycerine takes the character of non-vulcanized rubber, *i.e.*, that its parts can readily be joined, and that it dissolves in the usual solvents of caoutchouc. The glycerine must be boiling at the time of first contact.

Dental Advertiser.

CAMPBOR A SOLVENT FOR IODOFORM.—Camphor increases the solubility of iodoform in alcohol and ether. While one hundred parts of alcohol ordinarily dissolve not more than one and one-fourth parts of iodoform, the same amount of a saturated solution of camphor is capable of taking up as much as ten parts.

Dental Register.

Reports of Societies.

STUDENTS' SOCIETY OF THE DENTAL HOSPITAL OF LIVERPOOL.

The Annual General Meeting of the above Society, was held on Wednesday, 21st January. A large gathering of members and friends being present.

The election of officers for the current year were as follows:—

President—T. Mansell, L.D.S.

Vice-President—R. H. Bates, L.D.S.

Treasurer—W. H. Silmon.

Secretary—F. C. Dopson.

Council—L. Y. Osborn, F. R. Guyler, J. H. Burroughs.

The Secretary and Treasurer read their first annual reports, showing great progress of the Society.

Mr. D. W. Parsons then read a paper entitled "Mechanical Dentistry, and the last London Examination." [See page 255.] After which a very interesting discussion took place.

After a vote of thanks to the officers of the past year, the President announced next meeting for Friday, February 20th.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Ordinary Monthly Meeting, February 2nd, 1891. Mr. S. J. Hutchinson, M.R.C.S., L.D.S., *President*, in the chair.

The Minutes of the preceding meeting having been read.

Messrs. H. L. Albert, M.R.C.S., L.D.S., and Theodore W. Harris, L.D.S., were elected resident members, and A. W. W. Baker, M.D. Dub., F.R.C.S.I. and L.D.S.I., was elected a non-resident Member.

The nominations of Messrs. Vernon Knowles, L.D.S.I., London Road, Reading; C. A. Clarke, L.D.S., Vega House, 7, London Road, Forest Hill, S.E.; S. A. Coxon, L.D.S.I., 4, York Road, Wisbech, for Membership of the Society, were read.

The Librarian's Report was read. It stated the following works had been received :—Vols. 3 and 4 of "North American Fauna," issued by the United States Department of Agriculture. No. 1, Vol. XXII. *The Dental Advertiser* (Buffalo, U.S.A.). *Transactions of the Illinois State Dental Society* (2 vols.). *Comptes Rendus du Premier Congrès Dentaire International*, tenu à Paris, 1889 (per favour of Professor Dubois).

The Curator (Mr. STORER BENNETT) reported the receipt of the one donation to the Museum, viz., that of an upper model from Mr. Morton Smale, showing a miniature supernumerary tooth on each side of the mouth, on the buccal aspect of the molar series.

The PRESIDENT said he had searched the *Transactions* of the Society for precedents as to when the Inaugural Address should be delivered, and he had found that on some occasions it was given before, and on some at the conclusion of the meeting ; but he thought from the very nature of the address it should be taken rather at the first part of the meeting ; he accordingly should, on the present occasion, deliver his address before the reading of other communications. (See page 246).

Mr. HENRY SEWILL contributed a casual communication on "the etiology of empyema of the antrum." In the paper read by Dr. Felix Semon before the Society last year, the etiology of empyema of the antrum was exhaustively discussed ; the writings of authorities were collated, and it was shown that a preponderating weight of opinion supported the view that, although occasionally it may be due to extension of inflammation from accessory nasal cavities, the cause of supuration within the antrum in a vast majority of cases must be sought in dental disease. This is the view adopted by Dr. Semon, and that also which Mr. Sewill would uphold after having assisted in the treatment of a considerable number of cases. Of these cases a majority have shown the presence of dental disease amply sufficient to account for the empyema. In some few instances the teeth in the neighbourhood of the antrum had been extracted before the case came under observation, and in one the jaw had been edentulous for years ; but in every case there was a history of dental disease, and in most instances a clear association of this with the setting up of mischief within the antrum. The only pathological condition of the teeth which in Mr. Sewill's opinion seemed capable of exciting empyema of the antrum were such as are

capable of causing direct purulent or septic infection, namely inflammation, followed by gangrene of the entire pulp or of that of at least one root of a molar ; and suppuration around the apex of a root—periodontitis—which may be attended by necrosis or other morbid changes in the root-end. In most cases Mr. Sewill has been able to diagnose the existence of one or other of these conditions, and on extraction of the tooth has found an addition in a considerable proportion an opening—often very minute—from the alveolus into the antrum. In consultation with Dr. Semon and Mr. England, Mr. Sewill had lately seen a case in which dental disease seemed the only possible cause ; and yet, although a decayed tooth was present, it proved on extraction not to be the seat of either of those pathological changes which have hitherto in his opinion appeared those alone capable of giving rise to empyema. The patient, a lady about middle age, had suffered from characteristic symptoms for about two months. A careful differential diagnosis by Dr. Semon demonstrated the nature of the case, and also eliminated every possible cause except the teeth. Considerable tooth-ache had been present, before and during the antral symptoms, in the second bicuspid of the affected side. Examination showed the other neighbouring teeth to be free from active disease. The bicuspid was extensively carious. The pulp was exposed, and about two-thirds destroyed, but the last third retained its vitality and was extremely sensitive. The tooth was slightly sensitive to percussion, but there was no other sign or symptom of periosteal inflammation. Mr. Sewill gave it as his opinion, and Mr. England agreed, that the dental disease was not enough to form an efficient cause of empyema, but Dr. Semon being positive as to his diagnosis, and it being necessary in any event to open the antrum, they extracted the bicuspid. Examination showed that a portion of recent pulp occupied the upper portion of the canal ; the external surface of the root exhibited but slight signs of inflammatory activity. A communication between the alveolus and the antrum, admitting a bristle-wire probe, was found. The opening was enlarged in the usual way, and the diagnosis was confirmed when a large accumulation of fetid, inspissated pus was washed out by the syringe through the nose. As in most cases due to dental disease, and not of very long standing, this case rapidly improved under the usual treatment. The point of interest in the case is the apparently insufficient amount of dental disease ; and it would lead Mr. Sewill in

future more strongly than hitherto to insist upon the necessity of extracting teeth in every case of empyema in which they might be suspected as sharing in its causation. If so small an amount of dental disease be capable of giving rise to empyema, it followed that a careful watch should be kept on cases where teeth exist in the neighbourhood of the antrum, and it pointed to a danger in the so-called crown bar and bridge work in which diseased roots are often sealed, and so shut in that exudations can only find vent by burrowing towards the antral cavity. The question of the etiology of empyema was very important, the disease being much more common than is usually supposed. Mr. Sewill had lately tapped the antrum in five cases in as many weeks—four with Dr. Semon and one with him and Mr. Christopher Heath. Many patients go on suffering for years before the true nature of their malady is suspected. In the case just related a correct diagnosis was made within a few weeks, but in two other of the cases the patients were not so fortunate. In one, a young lady had suffered for not less than ten years; in the other, a gentleman, the malady had lasted many months, and he was put to great pain by treatment directed to the nasal cavities. It seemed the exception to meet with a case in which an early diagnosis had been made. Patients very rarely suspected the teeth, and did not apply in first instance to a dental practitioner. Few minor surgical diseases give rise to more distress. Not to speak of the pain, which is very often considerable, the patient is condemned to the perpetual consciousness of a noisome odour, and is troubled by a fetid discharge from the nose. Be it noted, the discharge is from one nostril only and not continuous, but occurring at intervals. These—the characteristic symptoms—are quite enough alone to produce great depression and injury to the general health. Mr. Sewill exhibited the tooth, and said he should be glad if it could be minutely examined and reported on later by the honorary Curator.

Mr. CHARTERS WHITE then read a casual communication on “a new method of demonstrating the structure of dental osseous tissues.” In the course of his microscopical investigations into the histology of the dental and osseous tissues it occurred to him, that while the present method of mounting them for examination was far superior to the old plan of dry mounting, yet it left much to be desired in clearly revealing any deviation in the ordinary structures :

for as Mr. Charters White had pointed out on many former occasions, the balsam in which they were mounted, running into any cavities such as the lacunæ and canaliculi of bone, or the dentinal tubuli of teeth, so obliterated them that little beyond blank transparency was presented to the eye of the observer, hence he had introduced the plan of mounting such sections in balsam when saturated with water, merely drying the surfaces before putting the section in the balsam; this method prevented any ingress of the balsam into the water-filled cavities, and entirely presented the structures in all their visibility. Mr. Charters White had now devised a method which would add still further to these advantages, inasmuch as cavities could be rendered more readily invisible to the highest powers of the microscope. He might be seemingly introducing a trifle, but as life is made up of trifles, especially microscopical life, and any new process, however trifling it might at first appear, might exert an influence in the direction of what might turn out more important in future investigations, therefore he apologetically offered this casual communication, trusting it might be of service to those of the younger brethren who might be pursuing the very fascinating study of the histology and pathology of the dental or osseous tissues.

The process he wished to introduce was not brought forward to demonstrate anything more in the histology of teeth or bone than what had been known from the earliest days of microscoping studies, but merely to show the possibilities underlying its adoption, as not only were the lacunæ of bone infiltrated by this method, but structures as minute as the canaliculi and also the dentinal tubuli were rendered more pronounced, whilst departures from normal conditions were made very evident.

This process is based upon that treatment to which the soft tissues are sometimes subjected, namely, *infiltration* and the *modus operandi* is as follows: Having cut your bone or tooth to a moderate degree of thinness, then transfer it to a collodion stained with fuchsine, where it may remain for three or four days till the stained collodion has had time to follow the ether into the minute ramifications of the structure. The section may now be placed in 50 per cent alcohol to harden the collodion and allowed to remain in this till the opportunity arises for grinding it down. This may be done with ground glass and powdered pumice with water in the way Mr. Char-

ters White usually recommended, taking care, however, to finish off by using worn out ground glass and water only, or the finished section will show particles of pumice powder, which annoys the eye and detracts from the beauty of the preparation. The coloured collodion being insoluble in water, no fear need be entertained of its washing out of the cells of the tissue in the process of grinding down. When sufficiently thin, which may be ascertained by frequent examinations under the microscope, the section may be mounted in balsam without heat, or what is better, a preparation sold by Baker of Holborn, and known as Van Heurck's medium for mounting diatoms. Mr. Charles White thinks if these few simple directions are followed, that with more time and care than he could devote to the process, results far from interesting than those placed under the microscope that evening would present themselves.

Mr. STOREY (Hull) then described a case of ununited fracture of the inferior maxillæ. Harry Gardener, æt. twelve years, in 1883 was run over by a cab, causing a compound fracture of the lower jaw. This was treated at the Children's Hospital for six months. A central part of the lower jaw was removed, whether at the time of the accident or afterwards was unknown; the probability was, that there were two fractures, one on either side of the middle line, and that the piece of bone thus separated necrosed. The present condition was that of an ununited fracture of the lower jaw, such union as existed being by fibrous tissue, the ends playing freely on each other at the will of the patient. The portion of jaw missing was that containing the right canine to the left first bicuspid inclusive. It was added that the patient appeared to masticate well, and was well nourished.

Mr. HENRI WEISS for Dr. J. ARKÖVY (Buda-Pesth) read a communication on "Ready Contours and Crowns made of Amalgam" [See page 241.]

The PRESIDENT invited comments if the members had had sufficient opportunity to examine the samples passed round.

Mr. W. H. COFFIN said Dr. Arkövy's specimens seemed to divide themselves into Bonwill crowns, made of amalgam and fastened on with amalgam, and amalgam inlays necessitating the taking of an impression which had to be sent into the laboratory. Mr. Coffin expressed a strong opinion that if a model for an impression or cavity were taken, a filling made in the usual way upon the model would be preferable to cutting and fitting the inlay from the solid.

Review.

The Medical, Dental and the Students Registers for 1891.

The "Medical Register," as in former years, has received very careful revision, and it embodies all the most recent information in regard to Acts of Parliament and other useful data. Whereas the register in 1876 (the first time such an estimate was made) contained 22,200 names, it will be found now to contain the names of 29,163 qualified medical practitioners, an increase since 1876 of 7,163 names—of whom 62·41 per cent. have been registered in England, 21·87 per cent. in Scotland, and 15·72 per cent. in Ireland. During the year 1890, 1266 new practitioners were registered, viz., 637 in England, 462 in Scotland, and 167 in Ireland, a number of slightly over the average for the last 15 years, which is 1,205. The number of names removed in consequence of reported deaths and other causes has been 556.

For the first time the "Medical Register" contains a separate Colonial register, appended in accordance with the provisions of the "Medical Act (1886)," which gave power to the medical council to recognise qualifications conferred in Colonies to which, by direction of the Privy Council, the operation of part II, of the Act has been extended. The list of such Colonial qualifications now registrable includes those of the Universities of Melbourne, Sydney, and New Zealand.

The "Dentists' Register" which has also been carefully revised, shows that there are now 4,817 dentists qualified to practise. The number of names that appeared in 1879, (the first Register) was 5,289, thus showing a decrease since that date of 472. Of the total remaining number 76·32 per cent., or 3,676 practitioners are registered as having been "in practice before July 22nd, 1878" as against 10·87 per cent., or 4,806 practitioners so registered in 1870. The numbers thus registered have shown a steady and continuous diminution, while, on the other hand, the numbers of Licentiates in dental surgery have shown as continuous an increase from 9·13 per cent., or 493 practitioners in 1879 to 23·36 per cent., or 1,126 practitioners in 1891.

The "Medical Students' Register" shows that 1,846 students were registered during 1890, viz., 974 in England, 643 in Scotland, and 229 in Ireland. Among other data

shown in this Register, there are given the numbers passed by the various Examining Bodies, and registered as having commenced their professional study at the various places of medical education.

Dental News.

THE HOSPITALS COMMITTEE.

On February 23rd, Mr. THOMAS RYAN (Secretary of St. Mary's Hospital, Paddington) said the hospital was founded in 1845. The letter system existed, but many grave cases were admitted without. There were no paying beds. There were 281 beds and the maximum occupied was about 255. The number of patients per bed per year was approximately 14. The whole of the district west of the Edgware Road and north of the Park was served by St. Mary's. He was non-resident having a salary of £400 a year. He was responsible to the Weekly Board. The hospital was governed by those who subscribed 3 guineas annually or who gave 30 or more guineas as a donation. There was a House and Finance Committee, and they practically managed the hospital. The Medical Committee considered the books and reports of the medical superintendent. He had the right to dismiss subordinate officers, but would have to report the circumstances. The medical superintendent had a salary of £160 a year, with board and lodging. All cases were taken in except infectious. There was a system of inspection as to the circumstances of the patients, and it proved that the hospital was not abused in its out-patient departments. The income was mainly from subscriptions which last year reached £5,227. The grand total of expenses last year was £23,608. Other incomes were donations, £3,177; dividends and rents, £2,521; legacies, £8,276; the Hospital Sunday Fund, £2,083; the Hospital Saturday Fund, £368; payments by probationers, £412; and the rest from miscellaneous small sources. The average income from legacies was £7,354. A hospital with a medical school attached to it was more expensive than one without, but it increased the area of those interested in the hospital, and increased its income. Cancer cases increased expenses; Children lessened the expense per

head. The extent of the maternity department would considerably affect the out-patient department expenses. Some hospitals were rated at their full value, whilst others would only pay a small fraction. The head of the nurses was the matron, who had a salary of £125, with board and lodging. She was responsible to the Weekly Board. The nursing staff consisted of the matron, 1 night superintendent, 10 sisters, 26 staff nurses, and 23 probationers. The nurses were trained at the hospital. The sisters' hours were from 8 A.M. to 10 P.M. They were off duty twice weekly, from 5 to 10.30; once weekly, from 7 to 10.30; every other Sunday, 3 to 10.30; and on Saturday from 2 to 10.30. Their holidays were one day per month, and one calendar month per annum. The staff nurses hours were 7 to 9 P.M. They were off duty twice weekly from 5, and once weekly from 7, and every other Sunday from 3 P.M. Their holidays were one day per month, and one calendar month per annum. The probationers' hours were from 7 a.m. to 8.30 p.m.; off duty two hours daily, from 10 to 12 one week, and from 2.30 to 4.30 in another week. Their holidays were once a month a day, and annually three weeks, but that was not all at once, but spread over a year. The night superintendents' duty was from 10 P.M. to 7 A.M., their holidays one night per month, and a calendar month per annum. The night nurses' duty was from 9 P.M. to 8.30 A.M. and the holidays the same as the staff nurses. As to their pay, the sisters commenced at £30, increasing to £40, the maximum. The staff nurses began at £20, increasing to £25. The probationers received £10 and all found. The hospital was affiliated to the National Pension Fund for Nurses.

Colonel BIRD (Chairman of the Weekly House and Finance Committee of St Mary's) stated that the hospital was governed by an open board, which was not advantageous to the hospital as it was open to anyone to come, who knew little or nothing of the hospital affairs.

Mr. HERBERT W. PAGE (ex-Dean of the medical school of St. Mary's) said that he was one of the surgeons of the hospital. The number of the students was 300. The school had increased considerably of late years. The average income was about £4,500. The expenses were £4,400. About £3,300 or £3,400 was required before anything was paid to the lecturers. The salaries altogether amounted to about £1,100. The largest sum that any man ever received for his lectureship was about £160, which was taken out of the

fees. The same man might hold other appointments, from which he would receive something in the same hospital and provided from the same funds. The Dean was responsible for the discipline of the students. There was a School Committee, which met once a month. There was a residential college, which was a commercial undertaking connected with the school, and the hospital had nothing to do with it. It would be a good thing, indeed, that somebody, perhaps connected with the London County Council—upon which there were some eminent medical men—should have some voice in deciding whether hospitals should or should not be erected in particular places. He should like to keep them absolutely free from any Government interference.

Mr. MALCOLM MORRIS, Surgeon of the Skin Department of St. Mary's Hospital, was then examined, and said that there was a considerable number of students attending that and other departments. If nothing else came out of the Committee than the one thing that no hospital should be formed without some licence, much good would be done, for that was most desirable, as it was now impossible for the benevolent public to discriminate between hospitals started for the benefit of private individuals and those started for the commonweal.

Mr. PEARCE GOULD, recalled, said that it was a serious matter that there was not now sufficient means of teaching their students. The general hospitals excluded infectious diseases—scarlet fever, measles, and small-pox—from their wards, and that was a great want. Whilst the old apprentice system for the medical curriculum had almost died a natural death, yet it did supply that which hospital training could not supply. It would be a great boon if they could have some system of apprenticeship after their curriculum. The experience gained in London was not strongly in favour of residential colleges.

On February the 25th, Mr. QUENNEL (Secretary of the Westminster Hospital), stated that the Westminster Hospital was practically a free hospital to both out and in-patients, the qualification being disease, and the severity of the case applying. There were governors' letters. There were 205 beds, and sometimes the hospital was quite full. Last year the average number of beds full was 184. There was a Quarterly Court open to all the governors, who were summoned by

circular. The executive of the hospital was the House Committee. The financial control of the hospital was under the Audit and Finance Committees. His salary was £400 a year, but did not reside at the hospital. Last year they received £2116 from dividends and rents; £1,461 annual subscriptions; £1,860 donations; £6,610 legacies; £1,145 Hospital Sunday Fund; £3,000 Hospital Saturday Fund—making, with a small amount from the miscellaneous receipts, a total of £14,109. The total expenses were £13,333. There was thus a surplus of £778. In addition to the funds mentioned, there was a sum of £24,000 in Consols transferred to the hospital. Last year they had £10,000 for the endowment of what was called the incurable establishment, £324 for the endowment of the lithontriptic ward, and there was £4,400 for the endowment of beds and cots. At present there was £50,806 to the credit of the general purposes and fund, and about £34,000 to the credit of the endowments. Last year the wages and salaries amounted to £3,599. There was no resident medical officer; there were two house-surgeons and two house-physicians. Small-pox, typhus fever, and scarlet fever cases were excluded; diphtheritic cases were taken in. Such cases were not isolated as a regular practice. It depended upon the severity of the case and the occupants of the ward. With regard to out-patients, the physicians were not obliged to see more than 20 new cases. He did not think the charity was abused on the whole. They had sometimes had to turn persons away from the hospital because there was no vacant bed. He did not think the medical relief in that district insufficient. He presumed he was responsible for the sanitary condition of the hospital. There was an architect, and also a chaplain, who received £200 a year. The medical staff was not paid. There were, however, a medical and a surgical registrar, who were paid £40 each, and a pathologist who received £50. If there were a central authority to have some control over the hospitals, even if consisting of hospital representatives, it might have the effect of withdrawing public subscriptions.

MISS PAYNE, Matron of the Westminster Hospital said that there were 8 ward sisters. The whole staff numbered 32 hospital nurses and 23 probationers. There were no paying probationers. The institution did not provide nurses for any other hospital. There was a large private institution for sending out nurses for private persons, and the charge was from one and a half to two guineas a week.

Dr. ALLCHIN, Dean of the Medical School of the hospital, stated, that the number of students was 100. The average receipts of the school were £1,860, and the expenses £913. The balance was divided amongst the staff and lecturers. The majority of the staff were also lecturers in the hospital, and they derived something from both sources, and probably the maximum since he had been connected with the school (20 years) did not much exceed £100 from both sources. There might be a great advantage in amalgamation of some of the smaller schools, but it would not be advantageous to have one central institution for the whole of London to teach the preliminary subjects of education. Students might be better prepared when they came to the schools. The finances might be utilised more than at present for the students. His experience, and that of most of his colleagues, was that the out-patient department was not abused, unless in very exceptional cases. There should be some limitation of special hospitals, as with few exceptions the work could be done better in general hospitals, and they necessarily diverted the funds from the general hospitals. He would like to see some system of licensing special hospitals.

Mr. DENT (of St. George's Hospital) gave evidence how far the out-patient departments of general hospitals might work in connection with provident dispensaries.

At the meeting on *March 3rd*, Mr. NEWTON H. NIXON, secretary of the University College Hospital, said that it was started in 1828 as a dispensary, and founded as a hospital in 1833. It was practically a free hospital. The beds numbered 207, and the average number in occupation was 181. There was a large out-patient department. There was a hospital committee, which met every fortnight. This was practically the executive of the hospital. There were also sub-committees. His salary was £600 a year, but he did not reside at the hospital. There was also a resident medical officer. He had the general superintendence of the hospital, for the preservation of order throughout the building, the control of the officers and servants of the hospital, except the nursing staff, but he could not interfere with matters under the control of the resident medical officer. The hospital is supported by annual subscriptions, £2,020 ; dividends, £2,947 ; legacies, £1,972 ; fees of students for clinical instruction, £596 ; people's contribution fund in aid of the hospital, £500 ; dona-

tions (including Hospital Sunday and Saturday Fund grants), £7,853. There was no landed property. The total amounted to £19,334. The expenditure last year was £19,560. He could not say that that was an unusually good year. The average of legacies during the last ten years was £4,300. There was always a dinner held, and 60,000 appeals were sent out yearly. There was a total of £112,042 permanent endowment. The resident medical officer's salary was £150 with board and lodging. All sorts of cases were taken in except infectious diseases. There was a surveyor who was constantly in the building. A plan of the drains of the hospital was kept up to date. The surveyor was paid 5 per cent. commission on the works carried out. The patients were nursed by a Church of England sisterhood, but nurses who were Roman Catholics, or of any other religious persuasion, were admitted. The chaplain has a salary of £70 a year. It was contemplated to rebuild the hospital. The patients, he said they were of a poor class, their wages ranging from 15s. to 19s. per week. If anyone came who earned as much as 30s. per week the medical officer would hesitate before admitting him. He certainly did not think the hospital injuriously interfered with the outside practitioner. The hospital was insured for £20,000. The clinical fees amounted to about £2,000, and the medical officers took two-thirds and the hospital one-third. Paying patients were not taken in.

Sister CECILIA (All Saints' Anglican Sisterhood) stated that the whole of the nursing of University College Hospital was carried out by the Sisterhood under a contract entered into between the authorities of the two bodies. There were, besides herself, 9 ward sisters, 56 nurses, and 13 probationers. The hospital should pay £1,820 per annum, for which the home should provide at least a sister superior, 7 sisters, one sister to act as night superintendent, 27 nurses—of whom 20 should be more than one year's standing and 2 should be at liberty for cases of isolation—6 probationers, and 14 male servants; that there should be no interference with the religious views of the patients; and that there should be a six months' notice on either side before the agreement was terminated. The Witness stated that complaint as to the conduct of the nurses would be dealt with by her. She went round the hospital daily. The nurses had a month's holiday every year. No inquiry was made as to their religious views.

Dr. BARLOW said, that he had been ten years connected with University College Hospital. Although the hospital was not perfect, the out-patient department was very satisfactory and was not overcrowded. There was no systematic inquiry made into the circumstances of the patients. It was, he considered, desirable to have an inquiry officer for the out-patient department of all hospitals, but the matter must be dealt with in a very broad way. He was very much in favour of out-patient departments. His hospital did not injure the outside practitioner. In fact in the casualty department many of the poor practitioners outside were greatly relieved. Patients were very distinctly benefitted by the students. In the first place, those hospitals which had medical schools attached to them were the most popular among the poor, and those in which the medical school element was most predominant were the hospitals that stood highest in the number of attendances. They heard from many sources that the school hospitals were most popular among the poor, who, so far from resenting the numerous examinations by the students, felt it to be a greater security.

Mr. A. E. BARKER, F.R.C.S., surgeon to University College Hospital, said, the hospitals were used for consultative purposes, and he thought they might be used still more for that purpose. He thought the poor and the public had great confidence in the present administration of the hospitals.

Mr. BERKELEY HILL (the late Dean of the Medical Faculty of University College) then stated, in reply to the Chairman, that there were 309 students on the books of the hospital. If they paid the whole of the fees at once for the whole curriculum the amount would be 130 guineas. As a maximum a lecturer might get £400 a year, and also get fees for clinical teaching. The minimum received by a lecturer might be 10 guineas. The school expenses were paid by the council, and did not come out of the funds of the charity. Replying to Lord KIMBERLEY, the Witness said he thought there were enough teachers in London, but some of the schools were not well equipped. The students were far better educated now than they were fifteen or twenty years ago. It would be a very great improvement to medical education if students were admitted to the fever asylums.

Mr. BRUDENELL CARTUR, F.R.C.S., said, the effect of special hospitals was, to a great extent, to deprive the general hospitals of the means of teaching which were greatly required

for the proper instruction of the students. The treatment was as good at the general hospitals as the patients would receive at special hospitals. Now that the general hospitals had these special departments the functions of the special hospitals had passed away. Such hospitals as the Consumption are useful. The hospitals for children had many disadvantages, in the sense of interfering with clinical teaching. The advantages of doing away with special hospitals would be greater than the disadvantages, and the advantages would be far greater if the funds could still be applied to hospital work. It would be very desirable that some central authoritative body outside the Government, something like the General Medical Council—of which he was a member—should be empowered to license all new hospitals.

VACANCY.

National Dental Hospital, 149 Great Portland Street, W.—The Post of House Surgeon is vacant Candidates must possess the L.D.S. Diploma. Applications with testimonials to the Secretary.

Dental Hospital Reports.

MONTHLY STATEMENT of operations during February, 1891.

	London.	Manchester.
Patients . . . . .	.	1133
Extractions	1540	717
„ under Anæsthetics	918	264
Gold Fillings	378	97
Other Fillings	1410	179
Irregularities	84	—
Miscellaneous	552	356
Artificial Crowns	30	—
Total	—	1613

House H. B. BOWTILL,
Surgeons W. MAY,
W. S. HOLFORD.

A.H.DERWENT

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SOME OBSERVATIONS ON THE DEVELOPMENT, DISEASES AND DEFORMITIES OF THE UPPER JAW.*

By WALTER R. GARROULD, M.R.C.S., Eng. L.R.C.P. Lond.

Mr. President and Gentlemen :—

I have to thank you for the honour you have done me in asking me to read this paper before you to-night.

I should, in at once addressing myself to the subject before me, point out that I intend, in the first place, to somewhat briefly dwell upon the development, and anatomy of the upper jaw, and then, at greater length, to discuss the deformities, diseases, and treatment of the same.

The superior maxilla seems to be developed in at least three pieces, and ossific centres appear very early in them, probably shortly after the 6th week, it being the third bone in the body to show signs of ossification, and these centres unite so speedily as to render their exact number a matter of considerable uncertainty.

The superior maxilla may be divided into a maxillary, and a pre-maxillary portion, the maxillary again is subdivided into a malar portion lying external to the infra orbital canal, an orbito-facial portion between the infra-orbital canal and the nasal fossa, and a palatine portion which includes the palatine process as well as the part of the nasal wall which immediately joins it. The premaxillary portion carries the incisor teeth extending as far back as the incisor foramen, it has an independent origin, and in the lower animals exists in many cases as a separate bone. The premaxilla is seen to be marked off

* A paper read before the Students' Society, of the National Dental Hospital

from the maxilla, by a fine fissure, the incisor fissure, which extends on the under surface of the palate from the anterior palatine canal to the alveolar border internal to the canine socket ; on the upper surface a similar line of demarcation exists passing for some distance on the nasal surface of the body, but there is no line of union to be seen on the facial surface as in the case of many of the lower animals.

The incisor process is formed as an outgrowth from the lower and fore part of the maxilla, and forms the front wall of the incisor sockets ; between it and the palate process, the premaxillary bone is formed and this remains distinct up to the 5th month of foetal life.

The sockets of the other teeth are formed by a growing downward from the maxilla of an outer and an inner plate, forming between a groove called the dental groove or sulcus, afterwards transverse septa begin to form across the dental groove and so mark out partitions for the teeth, the first one so marked out is for the canine tooth.

The first appearance of the Antrum of Highmore is as a small depression on the internal surface of the maxilla, at the 16th or 17th week, this depression gradually deepens and the hollow thus formed extends between the orbital and palatal portions of the bone, at birth, however, these two pieces of the bone are not separated.

The infra-orbital canal commences as a small longitudinal groove on the surface of the orbital portion of the maxilla, which gradually deepens, the canal being completed by the growing over of the outer margin. The following points should be noticed with regard to the ordinary anatomy of the superior maxilla :

1st. That the incisor foramina exist between the premaxilla and maxilla, or the two elements, and they represent the primitive communication between the nose and the buccal cavity, these are of large size in the lower animals and open separately on the palate.

2nd. That the lamina bounding the incisor foramen, on the inner side, represents the mesial palatine process of the premaxilla, the foramina of scarpa being formed between the lamina transmitting the naso-palatine nerves, the left being anterior.

3rd. That a median anterior palatine fossa having two incisor foramina opening into it is only found in man and in a few animals.

Studying the development of the Superior Maxilla embryologically, and tracing the embryo from the three primary layers of the blastoderm, the epi- the meso- and the hypoblast, and the subsequent progress of formation to the appearance of the notochord or chorda dorsalis, we see at the anterior end of the embryo a small dipping down, or marking off of the blastodermic layers, immediately in front of the anterior end of the neural groove, this dipping down increasing in size forms a transverse sulcus, the anterior limiting sulcus. This sulcus is formed by a forward growth of the anterior extremity of the embryo, over the part of the blastoderm immediately in front of it, so that this anterior end comes to project as a distinct head, the folding over of the three layers of the blastoderm thus forming the head fold.

Later observations tend to show that the cranium is developed separately from the face by two sets of cartilaginous bars. The parachordal cartilages and the trabeculæ-cranii, the latter, uniting in front, stretch forward to form the fronto-nasal plate or process.

The face is of later development, and is formed from a series of arches divided anatomically from their relations to the mouth as pre-oral and post-oral. The pre-oral arch consists of the two maxillary processes with the median fronto-nasal process the representative in the face of the united trabeculæ cranii.

The maxillary processes arise at first as little buds from the sides of the first visceral arch, these increasing in size stretch forward and unite with the external nasal process on each side, thus completing the pre-oral arch from which is developed the internal pterygoid plate, the palate, the superior maxillæ and the malar bones; from the lower part or tuberosities of the maxillary process, two thin lamellæ grow inwards thus forming the separation between the buccal and nasal cavities which were originally in communication. These lamella, called the palatal and pterygo-palatal processes, advancing inwards to the middle line, unite posteriorly and with the fronto-nasal process anteriorly, but in front the part of the palatal processes which unite with the intermaxillary process, does not form so complete a union, the naso-palatine canal being left as a representative fissure.

The fronto-nasal process forms a broad median lappet, extending between the ocular vesicles as far as the transverse cleft of the rudimentary month, free in front and below, behind

it is united with the parts developed from the trabecular axis. The lower border becomes divided into a median, and two lateral external nasal processes which form the nose and central part of the upper lip, it also gives rise to the intermaxillary process on the union with which and the maxillary and pterygo-palatal processes the integrity of the upper lip, jaw, and palate is dependent.

The size and shape of the human jaws seem to vary in different classes of mankind. A co-relation exists between the size of the bones of the extremities and the jaws, for they are shewn to be smaller in the civilized communities than among the savage races, or among animals, such as the carnivora. The strength of the jaws seems to be related to the conditions of life under which they exist, for in such animals which are solely dependent on their food by finding and lifting it with their jaws, it is only feasible that these should be larger and more developed, as well as their teeth, with which they tear hard, coarse and uncooked food, this again, acts on the masticatory muscles attached to the bones increasing them in size.

The erect posture of man also seems to have determined to some extent the smaller development of the jaws, for having acquired the art of manipulation, he has relieved the jaws from many duties which would otherwise necessarily have fallen to them, and the teeth also doubtless have become reduced for the same reason. It is really a good example of the physiological law of the use and disuse of parts.

The deformity which occurs in connection with the superior maxilla is cleft palate, which is a permanent fissure existing between the pre-maxilla and the maxilla on each side. Various degrees exist the uvula alone may be bifid; the cleft may extend through part or whole of the soft palate; or the hard palate may be divided as well; or, lastly, single or double hare lip may arise by the cleft extending forwards to the integuments of the face. When the palate is cleft, an opening exists between the nasal and buccal cavities, consequently there is considerable inconvenience in swallowing fluids, as there is a great tendency to regurgitation through the nose. The speech is also rendered indistinct and nasal in character. It is of the greatest importance to be able to feed properly infants in whom a cleft palate exists. They cannot suck, and if left without careful and periodical feeding by the hand, will speedily perish.

Regarding the operative treatment for this affection, it was until recent years, thought to be advisable to postpone the operation for closure of the soft or hard palates, until the patient was of such an age as to properly understand the importance of its success. Chloroform was never administered from the fear that suffocation might be caused by the entrance of blood into the air passages ; so that much of the success of the operation would in this case depend on the manner in which the patient was able to control his movements. But it has been shewn that with care anæsthetics may be used so that cases are now operated on much earlier in life, and it is said that 3 years is the most advantageous age.

The points to be observed in Fergusson's operation for cleft palate are,—1st that the levator palati and palato-pharyngeus muscles are divided, this is done to prevent traction of these muscles on the line of union. 2ndly, the edges of the cleft are pared from above downwards by means of a sharp pointed bistoury. 3rdly. The sutures which are introduced must not draw, or exercise any traction, on the palate but simply hold the two parts together. They must be left in for several days and need not be disturbed as long as they do not produce any irritation. In their withdrawal the upper stitch should be taken out first, the middle next, and the lowest one last. The voice does not as a rule recover its normal tone after the operation, this is due to two causes. 1st. To habit of a faulty articulation, which may be overcome by careful training, and 2nd, To the contraction of the palate along the line of the scar, so that the velum becomes unable to shut off the posterior nares from the pharynx.

The treatment for fissures of the Hard Palate is of two kinds, mechanical and operative. The mechanical treatment consists in the adaption to the fissure of an obturator, made of metal or vulcanite.

The operation is thus performed. An incision is made from the canine tooth reaching back to the last molar on each side. A second incision is then made along the edge of the cleft at the junction of the nasal and palatal mucous membranes, the soft structures covering the palate between the incisions are then raised, care being taken to include as much periosteum as possible, brought toward the middle line, and carefully united by means of sutures, no dragging or tension of the flaps being permitted. For if union be attempted in this way the wound will not heal by first intention, even if

sloughing is avoided. The advice formerly given not to close a fissure of the hard and of the soft palate at the same time has been disregarded, as it is now generally admitted that no good can be done by dividing the operation into two parts.

If the cleft be very wide, a well constructed obturator would probably suit the patient better than a surgical operation and it is probable that an adult would derive more benefit from the use of a well fitting obturator than from submitting to any operative interference.

The upper jaw is liable to many diseases. The mucous membrane of the antrum may be the seat of acute or chronic inflammation, pus may be pent up in the antrum, leading to what is known as *Suppuration in the Antrum*. This is usually caused by the caries of one of the teeth which come into connection with the antrum, these are the first and second molar, the bicuspid and the canine. It can however originate from an injury. The symptoms are a deep seated throbbing and cutting pain in the face. If the pus forms very quickly, or its amount be large, it may overflow into the middle meatus, and thus a more or less constant discharge of fœtid pus escapes into the nostril, in some cases it may escape through a tooth socket, thus producing a most unpleasant taste in the mouth, if however, the pus is retained, and no leakage occur, the side of the face will swell, the skin become darkened and brawny, the bony walls of the antrum will be so expanded and thinned that they give a crackling sensation when pressed on, and fluctuation may be generally easily felt; by pressure of the tumour thus formed the lachrymal duct becomes obstructed so that the eye on that side becomes watery.

The treatment of this condition consists in making a free exit for the escape of the pus, and this is best done by removing any carious tooth situated in relation with the antrum, but it may also be effected by puncturing through the canine fossa; with the exit of the pus the swelling will gradually disappear, the cavity should be syringed with tepid water, or some antiseptic, and the shape of the cheek restored by pressure.

Dentigerous cysts occur in the upper jaw as cysts of the antrum, they are formed in connection with teeth which have been retained in the jaw. 'Tomes believes that they arise from the excessive formation around a retained tooth of a fluid

which is normally found after the complete development of the enamel, between it and the soft tissues investing it." These cysts may occur at any age, but are most common among the young, the treatment is to remove the wall of the cyst somewhat freely, and thus to provide efficient drainage, removing the retained tooth at the same time.

Dropsy of the Antrum. In this disease the antrum becomes slowly filled with a fluid which varies in character, sometimes being mucoid, at others thin and dark containing cholesterin. It is due to a tumour springing from the mucous membrane of the antrum, thus causing by its enlargement expansion and thinning of its walls.

The cheek is pushed outwards, but the tumour is quite painless, and gives rise to a crackling sensation on pressure.

The treatment consists in opening the antrum from without, by lifting up or dissecting up the cheek, and thrusting a trocar through the most expanded part of the tumour, the opening into the antrum should then be enlarged, so as to allow of free drainage, and syringed out every day with some antiseptic solution, by this means the interior of the tumour is kept aseptic. It was once thought that dropsy of the antrum was caused by obstruction of the aperture leading into the middle meatus, and an ingenious operation for catheterizing the antrum was introduced with the object of drawing off the fluid, it was, however, unattended by any good result, and since the correct pathology of the disease has been ascertained has been abandoned. C. Heath recommends that a common Eustachian catheter, to which an india-rubber ball is fitted, should be used as an instrument for washing out the antrum.

Polypus of the antrum.—Mucous polypi are those most frequently found, they cause no symptoms, unless by their size they distend the cavity of the antrum, they then most commonly break down the inner wall by absorption and project into the nose. Their treatment is to remove them with polypus forceps when they project into the nasal cavity.

Solid tumours of many varieties grow from the upper jaw or its immediate neighbourhood. It is very difficult to say what part or tissue a tumour takes origin in, as these cases do not, as a rule, come under observation until late when the surrounding parts or tissues may have become affected.

Fibroma of the antrum is not uncommon, it grows from the periosteum, it increases slowly in size, and has no tendency

to infiltrate the surrounding tissues, but like other tumours of the antrum it tends by pressure to cause absorption of its walls, and so to spread in the nasal fossa, or to project forwards on to the face.

Enchondroma of the upper jaw is not a common affection, especially in its pure state, it is slow of growth, as a rule painless, and give rise to the same symptoms as fibromata.

Osteoma. Growths of a bony nature are occasionally found in the antrum, and by their growth cause a projection on the cheek, they consist of bone, having a more compact structure than ordinary cancellous tissue, their growth is slow and painless and they are sometimes pedunculated and spring from the outer surface of the bone.

Vascular tumours arising from the maxillary region are rare, and closely resemble in structure the corpus cavernosum penis.

Sarcoma. Various forms of the disease affect the upper jaw; they may arise from the maxilla itself or from the surrounding structures, the most common varieties seem to be the spindle and round celled sarcomata, and they may present their ordinary structure, or be partly ossified, or developing into cartilage. As a rule they form soft rapidly spreading masses, quickly infiltrating the surrounding parts and pushing their way into the sinuses and cavities around; being extremely vascular they sometimes pulsate; projecting into the nasal fossa in the form of polypi they bleed readily and cause obstruction. If the sarcoma grows behind the jaw it sometimes pushes its way into the cranial cavity. The alveolar border of the bone is often affected by myeloid sarcoma occurring chiefly in young adults, it being rare in other situations.

Epithelioma of the upper jaw is very frequently met with, it arises in three situations, it may spring from the gum, or from the mucous membrane of the antrum, or from the nasal fossa. If it spring from the gum it may penetrate the antrum and is usually of the squamous type. If it originate in the antrum or nasal fossa it is usually of the columnar or tubular variety.

Tumours arising in connection with the antrum give rise by pressure to the following symptoms, thus by enlarging downwards it pushes down the palate producing a bulging in the mouth, it also pushes outwards the alveolar processes and teeth, and so makes their outline irregular; by enlarging

upwards, it presses on the orbital cavity and so causes obstruction of the lachrymal duct, loss of vision, and displacement of the eyeball with its attendant symptoms. Enlarging inwards it obstructs the nasal cavity, and backwards into the pharynx, it renders respiration and deglutition difficult, and is often the cause of severe bleeding from the nose. Nasal obstruction is one of the earliest symptoms of malignant disease, the diagnosis being substantiated by the infiltration of the integuments, gums and sub-maxillary lymphatics.

It is of the utmost importance to make a correct diagnosis of diseases affecting the upper jaw, both for the purpose of treatment, and giving a proper prognosis for the same. Bearing this in mind, we have firstly to determine whether the tumour be fluid or solid; secondly, whether it be simple or malignant; and thirdly, to as accurately as possible define its origin.

Fluid tumours are recognized by the history of the disease, the gradual but uniform swelling of the antrum, the general sense of elasticity, and the fluctuation which may be felt late in the progress of the case, sometimes at the line of union between the gum and cheek, but it must be pointed out that all methods of external diagnosis are useless in some cases, and it is far better when any actual doubt exists to make an exploratory puncture, than to run the risk of making the necessary incisions with a view to excision of the upper jaw in a case which could well be treated by simpler means, this has actually happened to the best surgeons. It is a very difficult matter to be quite certain whether we are dealing with a simple or malignant tumour, so long as it is confined to the antrum, but it has been shown that if the tumour increase very rapidly in size, while in the antrum, it points towards its malignancy, although it is not always a safe sign, when once the tumour has burst through its confines, the diagnosis of its nature becomes clearer. *Age* certainly gives a clue, for simple tumours occur more frequently in young people, and malignant tumours in those more advanced in years. Much knowledge can be gained by the careful examination of the submaxillary glands, as, in malignant disease, they often enlarge, and become hardened, at a very early date. The sarcomata, however, form an exception to this rule, as they are especially malignant in their nature, infiltrating and spreading through the surrounding tissues, and forming secondary

deposits in the internal organs, yet at no time affecting the lymphatic glands. A malignant growth spreads very rapidly when it has once burst through the confines of the antrum, forming extensive infiltrations, pushing through the foramina and fissures of the skull, and early affecting the nose and the orbit, this latter is especially characteristic of malignancy. It soon affects the superficial structures of the cheek, and the soft structures within the mouth, and forms fungating masses in these and other situations.

In determining the primary seat of the tumour we must consider whether it springs from the antral cavity, the malar bone, or from the pterygo-maxillary fossa.

If it arise in the antrum, one of its walls are usually displaced as the cavity becomes expanded, and the line of the teeth may thus be rendered irregular. If from the malar bone, it usually works down between the gums and soft tissues of the face, not implicating the palate, or the regularity of the line of the teeth, but in its later growth it may involve the anterior wall of the antrum, and thus project as a secondary formation into its cavity. If the disease arise behind the superior maxilla, it, when increasing in size, pushes the upper jaw forwards, there being no deformity in the outline of the teeth, and no expansion of the antral cavity, but it must be admitted that a growth primarily originating outside the antrum can very early spread into the cavity, or pass into the orbit through the spheno-maxillary fissure, or spread among the bones of the face, and in these cases an exact definition of its primary situation must be exceedingly difficult.

Nothing can be done in the way of treatment of tumours of the upper jaw except their complete removal, and before undertaking this formidable operation we ought to consider and distinguish between those cases in which an operation could be performed with comparative safety and with a fair chance of success from those in which no operation should be performed. The following points should be attended to (1). Whether the tumour is simple or malignant. (2). If simple, whether it springs from the antrum, or from behind the superior maxilla. (3). If malignant whether it has passed through the walls of the antrum, for if in this case the cheek be freely movable over the tumour and the submaxillary glands unaffected, an operation might be undertaken, but if extensive infiltration of the cheek and enlargement of the submaxillary lymphatics have taken place, it is not wise to

interfere with the growth by operation. I do not propose to enter into the methods of excising the upper jaw this evening, and, therefore, this brings me to the conclusion of the subject. I must thank you for the patient attention you have accorded me.

OBSERVATIONS ON BROMIDE OF ETHYL IN DENTAL SURGERY.*

By J. FRED W. SILK, M.D.

Anæsthetist to Guy's Hospital (Dental School); to the Hospital for Epilepsy and Paralysis (Queen Square); Anæsthetist and Lecturer on Anæsthetics Royal Free Hospital.

MR. PRESIDENT AND GENTLEMEN,—In America and on the Continent, and especially in Germany, Bromide of Ethyl has for some time past been held in high repute by dental surgeons. In this country, however, I know of no records of its systematic employment in a similar manner; I was, therefore, very willing to fall in with the suggestion made to me in the summer of 1889, by my friend and colleague Mr. Newland-Pedley, and endeavour to obtain some personal experience of the action of this drug.

In laying before you the record of my observations, I am particularly anxious that it should not be considered that I appear as an advocate for the indiscriminate use of the drug, or that I in any way suggest that we have in bromide of ethyl, an entirely satisfactory substitute for any of the agents usually employed for the purposes of the dental surgeon. In the table of cases appended (Appendix A) I have endeavoured to record in a strictly impartial manner my own experiences, and in the remarks which I am about to make in elucidation of this table I shall endeavour to be equally impartial, leaving each of you to form your own opinion as to whether the drug is worthy of more extended trial.

History.—The anæsthetic history, so to speak, of bromide of ethyl, is a very curious and instructive one, but hardly comes within the scope of the present paper. In appendix B I have made a list of the most important authorities, and

* A paper read before the Odontological Society.

it will therefore suffice if I here mention that bromide of ethyl was first used as an anæsthetic by Nunneley, of Leeds, in 1849 ; was again brought forward by him in 1865, and some years later its use was advocated by Turnbull and by Levis in America. For its introduction into dental work we are, I fancy, indebted to Schneider, of Berlin, and Herz, of Vienna.

Properties.—It is not my intention to discuss in detail, either the physical and chemical properties or the physiological action of the drug, but in the course of this enquiry one or two points of practical importance have cropped up, to which I feel bound to refer.

In the first place, when you ask for bromide of ethyl ($\text{C}_2\text{H}_5\text{Br}$) be sure that your order is understood. By a mistake on the part of a chemist, bromide of ethylene ($\text{C}_2\text{H}_4\text{Br}_2$) has been substituted, and with fatal results. In the majority of my cases I have used Herck's preparation of the bromide, which is the one almost universally employed in Germany ; in some few instances an English sample of the drug was used, but although I am assured by Mr. Martindale, the chemist, that the chemical purity of this latter was quite equal to the German, yet I have not any doubt in my own mind as to the difference in the effects produced, the difference being strongly in favour of Merck's.

It is very probable that this variation in the effects, may be partly or even entirely explained, by the decomposition which the drug apparently undergoes on keeping, especially if exposed to light and air. If you refer to cases 16 to 20 you will see, that when a sponge was used which had been inadvertently left unwashed after the previous series of cases, the results were pre-eminently unsatisfactory.

It is usually asserted that one of the chief reasons which led to the disuse of the drug in 1849 was its cost, and although this is of course a minor point, yet I think I may safely say, that where any number of administrations are undertaken, the cost per patient is very little more than half the cost of nitrous oxide.

Sex and Age.—Coming now to the consideration of the various columns of my tables of cases. Both sexes have been dealt with in about the usual proportions, and the ages have varied from nine to forty-nine years. I think, however, that it would appear, that robust and healthy males tolerate the drug better than weakly anæmic females, or than children.

Dose.—Of course the amount necessary to produce anæsthesia varies *inter alia* with the method of administration. Thus with the open or semi-open method, as in the first seven cases, 70m to ʒiii were required. With the closed method, on the other hand, ʒiss has usually proved ample, and in many instances ʒi has sufficed. In making this estimate I have taken into consideration only single cases or first cases of a series, for as you see, in many instances the dose recorded simply represents the amount added to an unknown quantity remaining in the inhaler from the preceding case. But still I think there are a sufficient number of these single and first cases to warrant me in putting the dose down at ʒi to ʒiss. I am inclined to emphasize this point, because I fancy that a good deal of misapprehension exists on this score. For instance, the *British Medical Journal* has recently commented upon a death which followed the use of bromide of ethyl, and says that "not more than twenty grammes" were administered, but as this represents considerably over half an ounce, I should myself be inclined to express surprise at the largeness, rather than at the smallness, of the dose.

Method of Administration.—In the first seven administrations either a leathern cone, fitting closely to the face, and open at the apex in which a small piece of absorbent material was placed, or a Skinner's frame-inhaler were used, but neither of these plans quite satisfied me. In August last year I attended the International Medical Congress at Berlin, mainly with the object of obtaining some information upon this subject. I had thus an opportunity of observing the methods in vogue at the Berlin Dental Hospital, and consequently administrations 8 to 94 have been conducted by means of an ordinary Ormsby's inhaler,

In using this inhaler, the drug is poured through the facepiece on to the sponge, and it is then fitted to the face; little or no air is admitted for the first few inhalations, after which the cap of the airhole is slightly turned.

Time limits.—In estimating the time taken to induce anæsthesia, it would obviously be unfair to include all methods of administration together. Taking, therefore, only the closed method, *i.e.*, when the Ormsby's inhaler was used, I find that I have recorded twenty observations, from which I estimate the average time of induction to 66.8 secs., or slightly less than in the case of nitrous oxide. The duration of the anæsthesia thus produced I found to be 46.2 secs., an average

arrived at from the consideration of twenty-eight cases—this is nearly half as long again as with nitrous oxide.

Roughly speaking, the duration of the anæsthesia bears some relation to the time required for induction, but of course this is by no means absolute, and with the English samples of the drug the variability is very marked. It would certainly appear, too, that when the time from the commencement of the inhalation to the end of the anæsthesia exceeds two minutes, the after effects are very likely to be troublesome.

Phenomena.—The question which I have most frequently had to answer has been : “ How do you know when a proper degree of anæsthesia has been produced ? ” The reply to this is not so simple as might appear. In Berlin some stress seems to be laid upon the muscular relaxation, but I have not found that this is at all reliable. I have myself generally removed the face-piece when the faintest stertor is heard, or if that is obviously due to accidental causes, or if it is unduly delayed, the commencing weakness of the pulse or development of conjunctival insensibility are my guides. The stertor to which I refer is not the laryngeal stertor of nitrous oxide narcosis, but of a much lighter and regular kind, originating probably in the palate.

During the course of the inhalation, I think it will be found that the breathing becomes very slightly slower and shallower, but in the majority of cases these changes are almost inappreciable. I have never been able to detect any irregularity in the rhythm, nor, as a general rule, has any cough, laryngeal spasm, or bronchial irritation been set up. In speaking thus of the respiration, I would remind you that my remarks apply, only to the special methods adopted in the production of anæsthesia for the purposes of the dental surgeon, and are not in any way applicable to the effects produced when the anæsthesia is prolonged.

There can be no doubt, I should think, that the cardiovascular or circulatory system is much disturbed during the inhalation of bromide of ethyl. The primary flushing of the face is, I think, a pretty constant phenomenon, though it may be but momentary in its duration ; this effect is very similar to that produced by nitrite of amyl, and, I should fancy, may be explained in the same way, *i.e.*, arterial dilatation with consequent fall of blood pressure. This fall in blood pressure may, no doubt, to a certain extent, in itself account for the diminution in force, and increased frequency of the heart

beat, as observed at the radial pulse. It is highly probable, however, that other factors are at work, for to the flushing quickly succeeds a pallor, and the heart's action tends to become more feeble, slower and irregular.

I do not myself profess to be a good interpreter of sphygmographic tracings, which may possibly be the reason why I am somewhat sceptical to their value. Others, however, may have more ability, and greater faith in this direction, so I show you a few of the many tracings I have taken.

I think, on the whole, these tracings bear out the views I have put forward in respect to the effects of the bromide upon the circulatory system, especially if we remember, that the heart's action, immediately before the inhalation, is unduly accelerated by the nervous condition of the patient. Tracings of the F series, I think, are particularly interesting, as indicating the rapidity with which the blood-pressure, &c., is restored. This rapid recovery is, I believe, usual, and is of great importance.

In respect to the influence of the drug upon the nervous system, and through it upon the muscular system, there is one point with which I have been particularly struck, *i.e.*, the exceedingly transient character of the stage of excitement. In the majority of cases this stage has been almost inappreciable, and in all but Case 5 quite evanescent. This observation would seem to apply almost equally to nervous women, and to the robust and probably alcoholic navy, and it may possibly serve as an indication for the class of cases, in which the use of the drug is more particularly appropriate. Occasionally we get a very slight spasm of the fingers, or rhythmic movements of the limbs, &c., but I have never observed anything like the degree of spasm and movement which often accompanies nitrous oxide and ether.

In respect to other phenomena I have not much to say. The pupils tend to dilate. Increase in the salivary secretions was sufficiently marked to attract attention in Cases 21, 26, 28, and 29, but I have never seen it so copious as with ether. In some few instances the patients will make a groaning noise from the beginning of the inhalation, but this I have always ignored, and have not found that it either delayed or shortened the narcosis.

The anæsthesia which has resulted from the use of the drug has, to my mind, always been quite satisfactory, both in degree and kind, but on this point I hope we may have the

testimony of those who have operated in some of the cases recorded.

After Effects.—The after-effects of an anæsthetic are of very great importance, not only to the patient, but also to the dental surgeon. They may be divided into those observable immediately after the return to consciousness, and those developed at a more remote period.

In respect to immediate effects of bromide of ethyl, I have definite notes in thirty-nine instances. In eleven a certain amount of hysteria resulted; in ten others, more or less depression or prostration occurred. In one instance (No. 69) actual fainting ensued, but this was in a patient subject to what she termed "fainting fits." Actual sickness was noted in two cases (Nos. 1 and 19), and in seven others nausea was complained of. Slight and transient degrees of exhilaration were developed in three instances (Nos. 74, 83, and 91), and in many of the cases a certain amount of confusion of intellect has remained for some few minutes. Strictly speaking, of course, all these figures refer only to the thirty-nine cases noted; but in respect to the fainting and vomiting, I think that the numbers may very fairly be held to be applicable to the whole series, as it is extremely unlikely that such effects, if they had occurred, would have remained unrecorded.

By making use of post cards printed with my address, I have been enabled to obtain a rough estimate of the remote effects of the bromide in 45 instances. Of this 45, in no less than 29 the return was to the effect that the patients were perfectly well on their return home, and for the remainder of the day. Of the remaining 16, prostration or depression is noted in 5 instances, vomiting in 2, and headache in 3. In Case 55 the return was, "ill all day," but I was not able to ascertain of what this illness consisted; possibly it may have been simple hysteria. Of the remaining 5, dizziness, and other very trivial and doubtful complaints are recorded.

But there is another aspect of this question, viz., the relation between immediate and remote effects. In 17 cases observations of both appear in the table, and from these we gather, as might be expected, that the importance and severity of the remote symptoms is tolerably proportionate to the immediate after-effects. Thus, simple hysteria has seldom been followed by anything worse, while, on the other hand, nausea may be followed by sickness may be prolonged. This

somewhat negative evidence is of importance, for it enables me to say that, so far as my own limited experience is concerned, I have never met with a case in which serious symptoms have developed upwards of twelve hours after the bromide has been inhaled. Such cases have, however, been described.

Death-rate.—In preparing this paper, I have been very strongly tempted to refer to the dangers and the death-rate of bromide of ethyl, but on the whole I prefer to adhere to my original plan, and limit my remarks strictly to the facts that have come under my own cognisance, as exemplified in the record of cases. I am well aware of the importance of this point, however, though I cannot help thinking, that the fatalities which have been hitherto recorded, rather tend to exaggerate the dangers of the drug when used in dental surgery and in the way I have to-night described.

Conclusion.—Such, gentlemen, is my experience of the use of bromide of ethyl as an anæsthetic in dental surgery. In many points this experience is favourable, in many others adverse; so that, taking into consideration the relatively small number of cases which I have recorded, it will not be expected of me to express dogmatic opinions upon the value of this potent drug. Before sitting down, however, I must apologise for the length of my paper, and at the same time I should like publicly to express my indebtedness to Mr. Maggs and Mr. Mansbridge, and my other colleagues of the Guy's Hospital Dental School, for the permission they have so readily given me to use their cases for the purposes of this investigation. Without this help, and that of the senior students of the school, I could have accomplished nothing, and even now I feel that the result has been far less satisfactory than I could have wished.

APPENDIX B.

BIBLIOGRAPHY.

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to have been written, and the literature of bromide of ethyl may, therefore, be said practically to date from 1880.

The following list comprises the most important communications that have been made on the subject since 1880. I have myself verified the correctness of the references in the majority of instances; in some few cases, however, (distinguished thus*), this has not been possible, and my information is but second-hand.

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NOTES ON THE CONSTRUCTION AND ARTICULATION OF ARTIFICIAL DENTURES.*

By WILLIAM DYKES, L.D.S., Glasgow.

Mr. President and Gentlemen,—A great deal of our time is taken up, and rightly so, with the study and practice of conservative dentistry, but we meet with cases almost daily, where the teeth have been so neglected that it is entirely beyond the skill of the dentist to restore them to a useful state: it is then that our knowledge of prosthetic dentistry comes into play, and this, I think, is one of the grandest features of our profession. A surgeon has, after a case of amputation, to turn his patient over to some one whose only method of working is, as it were, by rule of thumb. Not so, however, with the dentist. He has it all in his own hands from first to last, restoring where it is possible, replacing where it is impossible to restore, not only for the purpose of mastication (which is certainly the primary object) but also to restore the fallen features of the patient, thus bringing into full play all his surgical, mechanical, and artistic abilities. In the replacement of natural with artificial teeth, we may compete with nature, but cannot of course pretend to surpass her, yet it is astonishing how closely she can be approached with the materials at our disposal. I remember reading more than twenty years ago, a speech delivered by one of the leading London men at a distribution of prizes, in which he said that he considered the acme of artificial teeth to be a gold palate, artificial gums, and mineral teeth, and I have often thought, that for good, useful, practical work, we might almost say the same to-day. It is not my intention, however, to discuss the merits and demerits of any particular kind of work, but to give you a resumé of my mode of procedure, in

* A paper read before the Manchester Odontological Society.

the construction and articulation of artificial dentures, which I intend to do in as brief a manner as possible.

First of all, with regard to the preparation of the mouth, I have no fixed rule. If the teeth to be replaced are beyond the line of vision, I may extract the roots, not otherwise. If the roots of incisors and bicuspid are at all sound, or can be treated in any way, I think it is better to retain them; this of course, entails a greater expenditure of time, and more trouble in fitting the teeth, but if the teeth are properly matched in size, and colour, and neatly fitted, they will look so natural that one feels amply repaid for the extra trouble involved. With regard to colour, I think it is always safer to err upon the dark side, for you will find, that when the natural teeth are a beautiful colour, tending to lightness, they are not infrequently set down as being artificial.

Sound and healthy roots in the lower jaw are often useful as they help to prevent the denture pressing too severely on the more membranous parts of the mouth.

I should like also to enter my humble protest against the practice of taking out sound natural teeth, or teeth that might easily be saved, because the dentist thinks they may spoil the appearance of his work, or make the new denture more difficult to construct, a practice which I am sorry to say is sadly too common.

The mouth having been properly prepared, the next thing is to obtain a good impression. I have tried everything in use for impression taking, gutta-percha, wax, plaster of Paris, and a variety of compositions, but now pin my faith to one, viz., godiva, and with the best possible results. Not that I object to plaster of Paris impressions, but that material is certainly not so agreeable to work in the surgery, and if I use it at all I do so only in edentulous cases. Should there be any peculiarity about the mouth, such as a high or V-shaped palate, select a suitable impression tray, heat it, and apply to it a piece of soft composition, moulding it approximately to the shape of the palate. Let this set hard and you can get a correct impression without making a special tray. For hardening the godiva when in the mouth, I often use a plan suggested by Dr. Wood, of Dumfries. Get the patient to hold a hand spitoon, just under the chin, and when the composition has been introduced and pressed thoroughly into place, hold the tray firmly in position with one hand, while with the other you syringe cold water all round the composition and over the

tray, you can in this way get it quite hard previous to removal and obtain as accurate an impression as it is possible to do in plaster.

Next to a good impression a correct bite is indispensable. In taking this, it is better to use as little composition as possible, especially in partial cases, as you can then fix the wax in the plaster model with less danger of straining it. To get the articulation correct in a partial case is comparatively easy, the natural teeth in most case is forming sure guides, but edentulous ones present a difficulty from the liability of the lower jaw to glide forward in biting. In making an upper case, I should model the case in wax, building up with wax at the back, with two or more teeth in front by way of a guide, try it in asking the patient to bite carefully several times, so that you can see whether it is the natural bite you are getting, then apply the lower model to the indentations in the wax, and cast the slab in the usual way. In the case of a full upper and lower when the angle of the jaw has become obtuse, one method of getting the bite is to take a piece of wood, cut it down to about the required thickness, or to about the width you think the jaws ought to be kept apart, place it in the centre of a piece of composition, get the bite as nearly as possible under the circumstances, cast your slab from that, set up your full set in wax and try in. You can then take notice as to whether the centre is correct, the teeth straight across, and the two canines on the same level. You may also see whether some improvement could be made with regard to restoring the contour of the face. Having noticed all these things carefully, for successful dentistry depends on trifles, you may then proceed to take your final bite by putting a small piece of composition at each side of the mouth, towards the molars and bicuspid, leaving the front entirely free so that you can see exactly how the patient is closing the mouth.

There is another method which, however, I have not tried for many years, viz., to build up the trial cases in composition modelled as in wax with spiral springs attached, you can then see how the mouth is being closed. When perfectly satisfied with the position of the bite, take a warm spatula and make a cross at each side, put the cases on their respective models, place in position and cast the slab. It may seem strange to some that I should speak of casting the slab, but I never use anything else. The only thing in the way of an articulator that I ever cared for was a common hinge and even that I

have discarded in favour of the slab. In setting up the teeth my invariable custom is to set up the lower first, taking contour and everything else into consideration, putting the upper centrals and laterals into position, then proceeding with bicuspid and molars, and leaving the upper canines to the last. By doing so, you can get your articulations better. When vulcanized, you may by a little adjusting, with the aid of articulating paper, get the bite so solid, as to do away with any clacking sound in the mouth, which is very disagreeable. Another preventive is to withdraw the two second lower molars, just before packing the flask, and insert white rubber in their place. You have then a tooth of rubber which will do away with the clacking sound. By the use of a silicate it will not require any finishing, but come from the flask in a polished condition.

Another thing I should like to draw your attention to is the use of vela rubber in lower dentures where the alveolus has been pretty well absorbed; in packing do so on the reverse, finishing off with a coating of the vela rubber, having before flasking, rounded all the edges with a warm spatula.

I am exceedingly fond of plate and vulcanite work for the upper, but I prefer vulcanite entirely for the lower, in fact my ideal of a set of teeth is a plate and vulcanite upper, a vulcanite lower lined with vela rubber, with white vulcanite blocks in place of the second molars, a shelf running gradually backwards and outwards from the first bicuspid, a pair of gold springs properly mounted, the teeth a nice natural colour not too light and perfectly articulated. Such cases can only be made by going carefully into all the details of the work, for as I said before, successful dentistry depends upon things trifling in themselves, which worked together go to form one harmonious whole.

A CEMENT for slides holding preparations in glycerine is prepared by Dr. S. Apathy (*Zeitsch. Wiss. Mikr.*) by melting together equal parts of Canada balsam and paraffin (60° melting point), and continuing the heat over a moderate flame until terebinthinous vapours are no longer perceptible, and the mixture has assumed a golden yellow hue. The mass, hard when cold, is applied by first melting again.

Dental Register.

British Journal of Dental Science.

LONDON, APRIL 1st, 1891.

PAST STUDENTS AND THEIR SCHOOLS.

THE Select Committee on Hospitals having now received the evidence concerning the large teaching hospitals of London, to a certain extent the interest in the evidence will slacken. So wide is the interest in these hospitals ; so large is the circle of people in some way or other connected with them ; or with the school which is attached to them, and grows up, as it were, under their shadow and under their protection ; that we feel we need no apology to our readers for having made our reports somewhat more lengthy than is our wont. Among the many very interesting matters which have been touched upon in the evidence, none will, perhaps, have excited more interest in dental circles than that which dealt with the inner working of the various schools. Nor is this mere idle curiosity. A man educated at a school, whether it be the educational school of his boyhood, or the medical school of his youth, feels that he has a certain interest in the school, it is *his* school. And this is a feeling which the medical schools, at all events, should endeavour to foster. For it is by the support which these students give, when they have ceased to be students, in the usual sense of the term, that the school grows, it is they who spread its reputation far and wide, it is they who are continually urging new students to go to *their* school, and it is through them that most of the pecuniary aid to the hospital comes. Yet, after all, when a man has left the school how little there is to attach him to it,

save sentiment, which some continually decry, but which is yet so powerful a force within most of us, working, happily, as a rule for good. We do, however, feel that it would be well if it were possible to find some more tangible link, than this, to bind men to their old schools. We know the whole question is beset with difficulties, it is a house of cards, which men are afraid of interfering with [for fear of wrecking the whole structure; but still, we do think, it would be possible to arrange matters so that men, who have passed through a school, should become permanently connected with it as are graduates with their University. What would the school gain by this? Some time ago a dean in his annual report, after the usual references to the school's doings during the year, concluded by hoping that some day some rich man would take a pleasure in rebuilding their school, and in endowing its lectureships. It was a pious wish, and has our sympathy, but we candidly confess that under present circumstances we should be highly surprised were it ever to meet with fulfilment, unless, indeed, the "rich man" were a member of the Staff. We fully recognize the debt a man owes to his teachers and his school, but so he does to his old school masters, yet one would hardly expect him to rebuild the school-house, even if he were rich; so does an apprentice to a rich merchant, yet it would be strange were he to be expected to build the latter handsome premises, even if, in later life, he became an East Indian magnate.

Our point is this, so long as the management of our schools, whether dental or medical, is vested in the hands of a few, practically self elected men, so long will past students withhold that support we fancy they would otherwise extend. In saying this it is not meant to imply any lack of efficiency in the management, but a desire to see them placed on a wide and firm popular basis. We know very well there are many objections to the affairs of the school being public property, the two things are, however, quite separate. Because a management committee is subject to popular election, wholly or partially, it is not necessary that they should take the

whole world into their confidence. Space will not allow us to treat of the question further at present. It is one about which there might be much discussion, and with advantage. It is not one about which we are able to offer any definite scheme, but one we have broached that we may have the opinions of others.

THE Seventh Civil Tribunal of the Seine department recently had an action brought before them for recovery of a debt due to a firm of dentists, in which their counsel, M. Le Berquier, contended that they had a right to recover during thirty years, the period during which physicians can do so. The court, however, held that dentists who wish to recover money owing to them must do so in *one year*, or lose their right of action. We do not know what the law on the subject of recovery of ordinary trade debts is in France, but one year strikes us, and we fancy will strike most other people, as altogether an inadequate time, any way, we cannot see why physicians should be allowed thirty years and dentists only one.

WANT of space has compelled us to omit the valuable table of cases which Dr. Silk published with his paper on "Bromide of Ethyl in Dental Surgery." The results are, however, incorporated in the paper. The tables will be found in the official transactions of the Odontological Society. We notice that Dr. Silk has found that the dose is about 3i, to ʒiiss, this agrees with the results of Gilles, of Cologne (an abstract of whose paper recently appeared in these columns), who found the average dose in 150 cases to be from 3 to 6 grammes.

WE must congratulate the Edinburgh Dental Students' Society, on the humour and artistic skill displayed on the menu and toast list of their recent annual dinner. These are surrounded by capital lithographic reproductions of pen and ink drawings which give a humourous rendering of different phrases used in dentistry. The points could hardly be brought out without the drawings.

Abstracts of British & Foreign Journals.

THE GERMAN DENTAL JOURNALS.

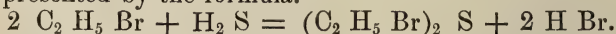
The *Deutsche Monatsschrift für Zahnheilkunde*, March 1891, contains an interesting but lengthy article on "THE IMPLANTATION OF ARTIFICIAL TEETH," by Dr. N. N. ZNAMENSKY, of Moscow, which was read before the Medical Congress of that city. Znamensky approaches the question by a consideration of the changes induced, and undergone, by various substances introduced into the tissues of the living body. 1st, ivory pegs placed in bone or larger pieces introduced between the ends of bone, to lengthen the limb, as was done by Professor Billroth; 2nd, pieces of elder-pith sewn beneath the skin; and 3rd, sponges laid on the surface of wounds. In all these cases the substances are retained (provided, of course, strict antiseptic measures are taken). This is brought about by the growth of granulation tissue into the porosities of the foreign body, which becomes permeated by canals, and its surface eroded, these canals and pits being filled by granulations which retain the body in situ, and, in the first instance, may, or may not become ossified. The part played by the various substances is purely passive, their union with, and retention in, the tissues is solely mechanical. Turning to the subject of the implantation, replantation, or transplantation of human teeth, recent or ancient, Znamensky maintains with Mitscherlich, Fredel & Scheff, that their retention is again due to purely mechanical causes. In the first place, the naked eye and microscopical appearances show an absolute similarity between the processes taking place here and in the before-mentioned instances. Granulation tissue grows into pits and canals formed in the root, this may become ossified or it may continue to spread till the tooth is loosened and falls out, just as a milk-tooth does. The reason why a root covered with pericementum unites more quickly and firmly than one from which this membrane is removed, is again purely mechanical, and not as Younger has maintained due to any vitality of the pericementum, preserved in mummies' teeth, so Younger would have us believe, through countless ages. If pericementum be present, we have a porous membrane into which granulations can grow at once

and so fix the tooth, whilst if it be removed, a much longer period is needed before pits will have become excavated out of the tooth substance into which the granulation will grow and fix the tooth. This porosity of the pericementum is increased by Younger's plan of soaking the tooth in warm water for some time before it is implanted. The influence of this porosity is shown by the fact, that if a tooth, devoid of pericementum, be soaked for a short time in hydrochloric acid before insertion, so that the surface becomes decalcified, union will take place as readily as were the pericementum present. This was discovered by Mitscherlich accidentally when using a little of the acid to cleanse some mummies' teeth. These considerations lead to the thought, that if an implanted tooth is held in purely mechanically, could not an artificial tooth also be so retained. This, if made of a durable material, (ex. gr. porcelain), would not be lost by resorption. Neither could it become rotten, nor could it be an agent for transmitting disease (ex. gr. syphilis).

Dr. Znamensky then describes experiments on dogs which he has carried out to determine the use, or otherwise, of this idea. He used teeth with porcelain roots strengthened by platinum pins running through their centre, or teeth on which he had built a root with glass-filling materials. Round the root he ground a series of notches, but in such a manner that, while they allowed the tooth to pass into the socket, they hindered its withdrawal. In some cases he made the roots of gutta-percha, but with these instead of cross-cuts, he bored holes right through the roots, indeed, he regards such holes as likely to fix the tooth more firmly than cross-cuts. Any material can be used so long as it is not a chemical irritant, and is durable. In conducting the experiment, the dogs were rendered insensible by injections of morphia, the lower incisor teeth were then extracted, and, as the sockets were small, they were enlarged. The bleeding was then checked by wiping the sockets out with cotton-wool moistened in a 2 per cent. solution of carbolic acid. A solution of iodoform in ether was then sprayed into the sockets, and over the artificial teeth which were then forced home. The tooth should fit somewhat tightly, and the gum come in contact with them. In two cases teeth so implanted became absolutely firm in twelve days, in a month the dogs could eat any kind of food, they were tested by Professor Sklifosoffsky and A. B. Vogt, neither of whom could with two fingers shake or remove the

tooth. In a third case, the dog gnawed at its chain before the tooth was firmly fixed, and the ultimate result was not so good. Dr. Znamensky has only tried this in one instance on a human subject, and that was not a favourable case, as the anterior alveolar wall was absent, and the tooth had already been extracted some six weeks, and consequently the socket had to be drilled out. A month later the tooth was, however, fairly firm, but as the patient had to leave Moscow, he was not seen again. He was to write if any unfavourable symptoms arose, but not having done so, Znamensky concludes, they have not occurred. He has not made any microscopical investigations, but hopes to do so before long on one of the dogs, gutta-percha having been used for the root, in this instance, it will be possible to obtain sections.

To the same Journal Dr. CONRAD COHN of Berlin, contributes an article on "THE FORMATION OF THE GARLIC-LIKE ODOUR DURING THE ADMINISTRATION OF BROMIDE OF ETHYL." Dr. Cohn has used this drug for three years, and expresses himself as thoroughly satisfied with the results, but among its drawbacks is a strong garlic-like odour which hangs about the patient for some days after its administration. This was equally present when the purest drug was used, neither did it resemble the odour given off by a newly opened bottle. The inference was, therefore, that the drug formed some new combination whilst in the body. Some experiments showed that ethyl sulphide ($C_2 H_5$)₂ S has a garlic-like odour. Now ethyl-sulphide is formed by warming together potassium-sulphide ($K_2 S$), and ethyl-chlorine ($C_2 H_5 Cl$).—Knowing the chemical similarity between chlorine and bromine, it is apparent that ethyl bromide ($C_2 H_5 Br$) would also probably form a sulphur compound and, indeed, by conducting sulphuretted hydrogen ($H_2 S$) into ethyl bromide, a garlic-like odour is given off. This change, Cohn believes to be represented by the formula.



This reaction he believes takes place in the mouths of the patients. Sulphuretted hydrogen is, as is known, always present in the mouth, and probably in increased quantity when any wounds are present, as would be caused by the extraction of teeth.

WILHELM SACHS, of Breslau, advocates the use of GILDED STEEL WIRE AS STRENGTHENERS in lower vulcanite pieces, he claims for them the following advantages. They are cheap. They are stronger than any other metal, and being covered with fine gold, no oxidation takes place at the surface, consequently, the vulcanite is in absolute contact with them. They are easily prepared, but are also sold by Pappenheim of Berlin.

The Correspondenz Blatt für Zahnärzte for the first quarter of 1891, contains a paper by Dr. ELOF FORBERG of Stockholm, on the use of CARBON WOOL for filling root canals. This is a preparation which was discovered by a Swedish engineer about five years back, and advocated as a dressing for wounds. This body resembles charcoal in its power of absorbing gases, it can be heated before use, and is thus aseptic; owing to some boric acid (which is used in its preparation) remaining in it, it is also antiseptic, it is unirritating. That prepared from cotton-wool or linen thread, is advocated by Förberg as most suitable for dental purposes. He has had considerable success with its use, largely due, he believes, to its absorbing any gases which may form about the root. In introducing it, he fills the root with a drop or two of carbolised alcohol, then passes in a portion of the carbon-wool, working it up the root with instruments. Förberg has been using it for the past four years.

Dr. HERBST, of Bremen, writes to this Journal to maintain his right to priority in the use of powdered glass as a filling material. He disputes Dr. Richter's statement that the discovery was due to Dr. Spaulding, who, Herbst says, used not powdered glass afterwards fused, but glass-inlays ground to the shape of the cavity.

When men make remarks in society meetings, "that all men falling away from manipulative ability will lean on plastic materials," it is time for us to speak plainly; for they imply that our use of plastics is a proof of our failure in manipulating gold, which is not a fact.

Dr. W. G. A. Bonwill, Philadelphia.

(Items of Interest.)

Reports of Societies.

STUDENTS' SOCIETY. OF THE NATIONAL DENTAL HOSPITAL.

The last ordinary meeting of this Society was held on Friday, March 6th, at 8 o'clock.

R. DENISON PEDLEY, Esq., President, in the chair.

The minutes of the previous meeting were read by the Secretary, and confirmed.

The following gentlemen were present as visitors, and received the usual form of welcome from the President :—Messrs. Garrould, Nunner, C. Bascombe and W. T. D. Timms.

The President read out the names of the following gentlemen who was proposed for election as members :—Messrs. C. Bascombe, Burgess, Farmer and Ward.

CASUAL COMMUNICATIONS.

The Secretary presented to the Society on behalf of Mr. Stanley Read, seven cases :

1. An upper central with a large erosion cavity.
2. An upper molar with four fangs.
3. A lower molar with three fangs.
4. A model showing two centrals which have been re-planted in a patient aged twenty-nine, the teeth being forced out with the gag under nitrous oxide, on November 4th, 1890. They were replaced about an hour afterwards, and held in position with a Hammond splint made out of a hair-pin, that being the only suitable piece of wire handy, which was kept in position by means of binding wire. It was removed in five weeks, the teeth being quite firm.
- 5.—A model showing a second pair of permanent central incisors in a man aged thirty-five. They are yellow badly formed teeth, and the history is that the patient had an ordinary pair of front teeth, but they became decayed, and subsequently loose, and he had them removed and replaced by two artificial ones, one of which had broken off and allowed the left central to erupt properly, but the right artificial tooth rested on the cutting edge of the partially erupted right central and accounted for its broken edge.
6. A model of the mouth of a boy of eleven years of age

who had had immediate torsion performed on his left permanent lateral six months ago.

7. A model of a child's mouth (female) of the age of three and a half years, with a supernumerary tooth in the lower jaw between the right central and lateral.

Mr. GREETHAM showed models for regulation of the front teeth of a girl twenty-five years of age. The six front teeth of the upper are very irregular and honeycombed, and on closing the mouth, the lower incisors come in contact with the gum in the upper jaw, moreover the patient objects to wearing a case.

Mr. CLARKE showed a split upper wisdom, which had been removed in two pieces, from the right upper jaw of a patient fifty years of age, after suffering severe pain.

In commenting on the above communications, the President said that replanting teeth was not unusual, and mentioned a case of a gentleman, who, twenty-three years ago had had two front teeth knocked out by a pole, which were immediately replanted by his father, Mr. George Pedley, and which had recently come under his notice. The teeth were slightly discoloured, and a small abscess had formed at the apex of one of the roots causing pain.

Regarding the length of time which might elapse before replanting teeth, he mentioned a case in which a tooth had been extracted at the request of a patient, and which was afterwards discovered to be the wrong one. The tooth was replanted after a space of 58 hours, and lasted three years.

Respecting Mr. Clarke's case of the split upper wisdom, he said such cases were unusual, though not remarkable, inasmuch as teeth in people of that age are very brittle.

In replying to the case brought forward by Mr. Greetham, he said that the removal of the five front teeth was the best advice he could give, and no other mode of regulation he was sure would give satisfaction either to the practitioner or the patient.

Mr. Greetham here said, that was the advice he had given the patient.

No further observations being made on the communications, the President then called on Mr. W. R. Garrould to read his paper on "Some Observations on the Development, Diseases, and Deformities of the Upper Jaw." (See page 289).

In reviewing Mr. Garrould's paper the President chiefly dealt with those subjects of interest to the dental students,

namely, "Cleft Palate," "Abscess of the Antrum," "Cysts," "Malignant Diseases of the Jaws," and "Sarcoma," in conclusion strongly advising the students to pay great attention to the out-door patients of the General Hospital, where they would meet with more cases in connection with diseases of the mouth than at the Dental Hospital.

A rather long discussion then took place in which the President, Messrs. Clarke, Fisk, Cutts and Timms joined.

Mr. Garrould having briefly replied, and a vote of thanks having been tendered him (proposed by the President, and seconded by Mr. Cutts), the meeting was adjourned until Friday, April 3rd, when Mr. Clarence Masters will read a paper on "The more common Diseases of the Teeth."

THE EDINBURGH DENTAL STUDENTS' SOCIETY ANNUAL DINNER.

THE seventh Annual Dinner of the Edinburgh Dental Students Society was held in the Windsor Hotel, Edinburgh, on the evening of Thursday the 5th March. Mr. Andrew Wilson, L.D.S., the Hon. President presided, and Mr. Herbert Ezard L.D.S., acted as croupier. Over fifty gentlemen were present.

After the loyal toasts, the chairman proposed "the Edinburgh Dental Students' Society" and in doing so sketched the work done during the recent session, particularly calling attention to the fact, that the papers were contributed entirely by present students. The croupier, as the newly elected president of the Society, replied. Other toasts "Kindred Societies" proposed by Mr. T. Maxwell Wood, replied to by Mr. T. S. Amore, L.D.S., England; "The Edinburgh Dental Hospital" proposed by Dr. Symington, reply Mr. Macleod: "the Edinburgh School of Medicine" proposed by Dr. Guy, replied to by Dr. Stevenson Macadam, Dr. William Craig, and Dr. Francis M. Liard. "The Guests" and "The Chairman" concluded the official toast list.

The evening was pleasantly varied by an excellent programme of music. The members of the dental profession who contributed being: Mr. Perkin, who presided at the piano; Mr. Frederick Page, L.D.S., the author of an amusing menu card: Messrs. Munro, Shepherd, Campbell, Johnstone, Ezard, and Dr. Guy.

The guests vied with each other in their contributions, recitation, song, and ventriloquial entertainment, to add to evening's enjoyment.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN

DISCUSSION ON DR. SILK'S PAPER.

The PRESIDENT said, in order to bring the discussion within satisfactory limits, he might ask those anæsthetists, who were present to give the Society the advantage of their views first, and then he should be glad to hear the experience of any dental operators who had tried the anæsthetic.

Mr. WOODHOUSE BRAINE wished to state at the outset that he had never seen bromide of ethyl administered, but he had very carefully gone through Dr. Silk's paper, of which he had very kindly sent him an advance copy, and he confessed that he was not satisfied with the results which the drug had given. It seemed to him that in a very large number of cases the heart gave evidence of failing, and up to the present there had been a certain number of deaths traceable to its use. In his opinion exactly what could be done with this anæsthetic could also be accomplished with chloroform, but with precisely the same risk of life—a risk which did not exist when employing gas and ether. He felt sure that they were all grateful to Dr. Silk for having tried the drug, but he wished to point out that it was no new thing ; it made its appearance as far back as 1842, but was given up or lost sight of until about fifteen years later, when it was brought forward again ; for another period little or nothing was heard of it, and then it was once more taken up in America. It had, therefore, had two or three good trials, and Mr. Braine was of opinion that if a thing could not hold its own after three good trials it was not worth much.

Mr. G. H. BAILEY thought Dr. Silk was in error in saying that bromide of ethyl had not been used in this country in dental practice. Both Mr. Clover and he (Mr. Bailey) had employed it, but had been compelled to relinquish its use owing to the very unsatisfactory results which they had obtained. Mr. Bailey read a quotation from an article by Mr. Clover, and which appeared in Quain's " Dictionary of Medicine," in which he described its properties and uses, and finally referred to its dangerous effects upon the heart. Mr. Bailey had recently been addressing a post-graduate class upon the subject of anæsthetics, and he had been compelled to warn it against the use of the bromide of ethyl. But what had surprised the speaker was that after seeing the most

alarming statements given in the last two columns of Dr. Silk's "Table of Cases," Dr. Silk had said anything save in discountenance of the anæsthetic. His results had certainly shown how dangerous it was, for hardly a single instance of a thoroughly satisfactory result appeared to have been obtained. These results tallied with Mr. Bailey's own experience, and he must remind the members that two deaths had resulted from its use. Quoting from an editorial note in the *Lancet*, Mr. Bailey said that giving nitrous oxide was now so safe as to amount almost to a simple formality, but such was not the case with bromide of ethyl, and he strongly deprecated that dentists should be taught to employ an agent so dangerous and one requiring such special and skilled administration. A constant danger with bromide of ethyl was its liability to decompose and liberate pure bromine, and to this peculiarity were to be attributed the fatal events which had followed its use. Mr. Bailey agreed with Mr. Braine when the latter spoke of chloroform giving identical results when administered in the way Dr. Silk used bromide of ethyl, but it should be remembered that way was—at least for chloroform—a most dangerous way, and was, in fact, the "closed method," air being almost excluded.

Dr. DUDLEY BUXTON feared that in rising he was following an inclination to loquacity rather than the scientific caution which taught silence save when fresh facts were to be given, because, like his friend Mr. Braine, he had no personal experience of bromide of ethyl in dentistry; but as he possessed some knowledge of it when given in general surgery, he might really plead as an excuse for speaking, that he did not regard it as a safe plan to dissociate the account that Dr. Silk had given of the use of bromide of ethyl in dental surgery from its use in general surgery. It seemed to him that the time limit—*i.e.*, the length of time required for the induction of anæsthesia, or the shortness of time occupied by the operation—had nothing at all to say to the amount of danger involved by this or any other anæsthetic. It had been shown years ago that the danger of the alcoholic compounds seemed to be mainly due to the haloid material—chlorine—contained in the molecule, or in this case bromine. And a close study of the alcohol and ethereal anæsthetics seemed to show that the potency was in some way closely associated with the complexity of the molecule. Starting from alcohol—itsself an anæsthetic, as unhappily the streets of

London showed only too often—they found that the various substitution compounds in the series gave more or less anæsthetic properties. Further, analogies between the replacing atoms in the molecule made the resulting bodies more or less allied in their properties. It appeared to Dr. Buxton, from the observations he had made, and which when more mature he hoped to place before the profession, that in bromide of ethyl they were dealing with a drug closely allied to chloroform, not only from the chemical, as would be expected from what he had said above, but also from the physiological, point of view. It had been the fashion to decry chloroform, but he was not at all one of those who had a feeling of antagonism towards it. He thought it a very valuable agent when given with a full sense of responsibility. It might seem that he was wandering from the point, but he was only doing so because he wished to point comparison between chloroform and its analogue bromide of ethyl. Chloroform, they all knew, would produce a short or long anæsthesia in proportion to the dose employed. It was perfectly well known that a few whiffs of chloroform would produce slight anæsthesia without after-effect. On the other hand, bromide of ethyl, although possibly useful in short operations, could not be employed for long ones. It would be said, therefore, it can be used for dental operations. Yes, but in using it it must not be thought that an agent was being employed which was free from all danger, for Dr. Buxton believed that its physiological action was such that it might any day cause death, and his opinion was borne out by the cases reported from abroad. Possibly those present were familiar with the deaths met with by Levis and Pancoast, which were from heart failure, though it was said death also followed from failure of respiration. Dr. Silk had shown that one gets heart failure in some form or another in a terribly large proportion of the cases cited, and any substance which produced heart failure ought not to be employed in operations so trivial as those carried on in dental chairs. They must admire the courage of anyone who would give bromide of ethyl a trial in dentistry, and he would conclude with the expression of his thanks to another man who had stepped into the breach, and accomplished this useful work.

Mr. BARRETT asked if Dr. Silk would say if he thought it necessary that the patient should fast before taking bromide of ethyl.

Mr. W. A. MAGGS said that he had operated with bromide of ethyl, and certainly the first cases were not ones which Dr. Silk would take the value of the anæsthetic form. In these the closed method with the leather cone was adopted, and the flushing, excitement, and other symptoms were exhibited. As to the period of anæsthesia, in his experience it lasted from fifty to sixty seconds, but the difficulty of telling when the patient was anæsthetic was to him considerable ; he could, of course, see that the breathing was much shallower, but it was difficult to tell when the patient had had enough. Then with regard to the recovery, patients seemed very much knocked over, much as they do in chloroform, but there was no hysteria or excitement—the patients seemed to recover more gradually than with gas. He did not remember any case in which the after effects were so serious as to necessitate any kind of treatment.

Mr. W. H. COFFIN said that it would be hardly necessary to remind the members that at the International Medical Congress of 1881, no less an authority than Dr. Squire advocated the use of bromide of ethyl, and Mr. Coffin believed, especially for the dental profession, under the impression that the effect and recovery were rapid. At the close of the paper Professor Wood of America opposed its use, and stated that in the United States it has been practically abandoned as more dangerous than chloroform without any counter-balancing advantages. Mr. Coffin had, nevertheless, operated a number of times under the drug, and was bound to say that his impressions of it were not favourable. Upon the last occasion of his use of it, the young and enthusiastic anæsthetist who administered for him said, "The beauty of it is, you never get any after-sickness ;" the anæsthetist leaving soon after the operation, was probably still under the impression that sickness never ensued, but Mr. Coffin's memory of that occasion was far otherwise. Mr. Coffin called attention to the extreme interest attached to the drug from a chemical point of view on account of the simplicity of its formula, and as being so symmetrically analogous with ordinary or ethylic alcohol. Its formula might be described as the simplest haloid derivative of the saturated hydrocarbon ethane, C^2H^6 , in which one atom of hydrogen was replaced by an atom of bromine. And alcohol was the corresponding derivative in which an atom of hydroxy replaced the hydrogen atom. Upon this view ethylic alcohol

might be called hydroxide of ethyl. These considerations might assist in the comparison of the physiological effects of alcohol and the bromide respectively. If he might go beyond its use as a general anæsthetic, he might say that he had a distinct recollection of his father using it some years ago for reducing irritation of the throat, laryngeal spasm and for asthmatic attacks.

MANCHESTER ODONTOLOGICAL SOCIETY.

The usual monthly meeting of the members took place in the Grand Hotel, Aytoun Street, Manchester, on Tuesday evening, February 10th, the President (Mr. H. Campion) in the chair.

The PRESIDENT said he was sorry to have to announce that since their last meeting they had lost one of their oldest members through the death of Mr. Molloy their Treasurer. He was well known, very much respected, and would be very much missed by them all. At the request of the council he had written a letter to Mrs. Molloy expressing the sympathy and condolence of the society with her and her children in the great affliction which they had sustained, and he had received a letter from Mrs. Molloy expressing her thanks for their sympathy in her bereavement.

Owing to the kindness of Messrs. J. Howard Mummery, T. Charters White, J. J. Andrew, and Dr. G. Cunningham, Mr. G. G. Campion was able to show, with a lantern, a large number of admirable photo-micrographs, illustrating different points in the development, histology and pathology of the teeth.

The discussion on Mr. Dykes' paper, which was read at the last meeting was opened by

Mr. DOUGAN who said he could not agree in Mr. Dykes, that godiva was always the best thing to take an impression with. He did not think it was best for taking impressions of the mouth when the teeth were long and loose. Nor did he think it was wrong to extract such teeth. He would like to know how long the white rubber used in the place of molars would last. Some patients complained that their teeth made a noise. He had obviated that by grinding slots in the molar teeth in which he inserted a piece of wire which projected so

as just to touch the opposite jaw before the tooth did, and so prevented the "clacking." He thought that was better than putting in white rubber which would gradually wear away. A suggestion had been made that the manufacturers should make diatoric teeth in an enlarged tube through which the vulcanite could pass. He might point out that Messrs. Ash and Sons had made such teeth for the last twelve years. He never used springs, as he did not know how to fix them properly, but he had sometimes fitted them to old work. In his practice, when the upper alveolar arch was very small he never attempted to make the teeth meet squarely, but was satisfied if he could get them to meet just at the edges, so that the upper teeth would not overhang the alveolar border, and that the lower teeth should not encroach on the tongue. By that means the lower plate was not lifted up by the tongue, and the upper being narrow was not pulled down by every movement of the cheeks.

Mr. P. HEADRIDGE said he had used both gutta-percha and plaster of Paris, and he could quite understand that the former would not take such a correct impression as the latter, owing to its tendency to push aside the soft parts of the mouth, thus causing the denture, when made, to rest heavily on those parts. A great many of them used new gutta-percha, but, as he explained some time ago, the older it was the more likely it was to take a correct impression, but it had to be used very carefully. Boiling it in water containing soda cleansed the gutta-percha from grease, took away the stickiness, and helped to prevent sucking. If he wanted a good impression, he filled his tray with old gutta-percha and covered it with a thin film of new. He did not often use plaster of Paris. He thought the bite was the most important part of the mechanical work. There was not sufficient attention paid to the articulation of the mouth generally, and they often found patients complaining of their teeth, owing to the "bite" being too high, and hence causing pressure on the soft parts. He used a "Bonwill's" articulator, which he found of great service. He thought the use of springs had gone out of date. Of course in cases where there was paralysis of the throat or tongue they had to adopt means to meet the want of muscular power, namely, by using springs. In fitting springs, however, they ought to fit them so as to prevent them bearing against the muscles of the cheek, and also so as to allow them to have free play. "Clacking" in his opinion

was due to the insufficient attention being given to the fit of the teeth.

Mr. JONES said he did not agree with Mr. Headridge, that springs were entirely obsolete, as he had found, from his experience, that they could not altogether be done without. If springs were a modern instead of an old invention, they would be thought a great deal of. If they were fitted in a proper way there could be no objection to them. He would like to know what Mr. Headridge would do in cases of partial paralysis, or in cases of difficult articulation, owing to the enlargement of the tongue? He thought that each of the materials which had been mentioned had their proper place in which to be used, and he thought springs also had their proper place. He did not think they should leave the stumps of teeth in the mouth, as ulceration might arise. Where they were making a complete set of teeth it was, in his opinion, wise to remove all the stumps.

Mr. W. HEADRIDGE said that a great many years ago he worked a great deal in gutta-percha, and could not think why he abandoned it. The only gutta-percha in those days was in the natural state, as near flesh colour as possible, and mixed with the bark from the trees. It was then boiled until it was fit for use. He himself thought that plaster of Paris was the most perfect material they could get for taking an impression of the mouth, as it could be applied in a very soft condition, and thus get a correct model of the soft parts. In removing teeth he would never remove the lower roots if he could possibly help it, because he thought they were of service in steadying artificial teeth in the lower jaw. In cases where there was any difficulty in using plaster of Paris, he used gutta-percha. He did not care to use wax, although he believed with care, that it was quite possible to take an excellent model with it. He too had often had complaints from patients about "jarring" sounds. Unfortunately the men who made the teeth were not the men who mounted them, and the result was that no real scientific thought had been brought to bear on this particular point of the subject. His lengthened experience was not favourable to the use of springs and he did not wonder at them frequently getting broken from the manner in which they were often fitted to artificial dentures. He had very rarely used them but he would not hesitate to do so in any case which came under his notice, in which he thought they would be useful.

The PRESIDENT said he recollected a case in which he used the diatoric teeth, and for some time were successful, but when the rubber wore away the noise was nearly as bad as before.

Mr. W. HEADRIDGE asked why they should not put a gold pin through the centre of the rubber?

Mr. DOUGAN replied that he had done so. He had also used Mr. P. Headridge's suggestion of boiling old gutta-percha in water containing soda, and had found it of the utmost benefit in removing the stickiness.

Mr. SIMMS said he joined issue with Mr. P. Headridge in saying that the plaster of Paris was the best to use in all edentulous cases. They could often obtain just as good impressions with other materials if proper precautions were taken. He also thought that the "clacking" of teeth was often due to their being misfitted. It was a very difficult matter to obtain a perfect fit of the teeth, so as to prevent them tilting on one side or the other, and this defect caused a noise in mastication.

Mr. HOUGHTON said he had been delighted with the result of an impression he had taken by a peculiar method with wax. He melted the wax and then allowed it to stand three or four minutes, and as it was settling worked it up into a paste, and then applied to the mouth. There was no shrinkage, and it did not disturb two teeth which were loose. He felt certain that plaster of Paris would have pulled both of them out.

Mr. P. HEADRIDGE pointed out that old gutta-percha was more useful for taking impressions than new, because it was more easily softened, and it was less liable to drag. The only tendency it had, however, was to stick, but that could be obviated by covering the old gutta-percha with a thin film of new. Boiling in water containing soda also made it less liable to stick.

Dr. WAITE (visitor) said that if they wished to remove the toughness of gutta-percha, they could do so by incorporating with it oxide of zinc, of which it would absorb six or seven hundred parts without losing it plasticity. They could then manipulate the gutta-percha with ease by warming it.

Mr. P. HEADRIDGE said he had tried that method, but had not been successful with it.

Dr. WAITE said he might not have made the gutta-percha hot enough. Referring to the lantern slides which had been shown, he said that he would yield to nobody in his admira-

tion of the value of scientific research, but they were apt to forget that neither scientific research, nor the advantage of the conservative treatment of teeth could become applicable except by the aid of mechanical knowledge and mechanical skill. In other words, that mechanical knowledge lay at the foundation of their work as dental surgeons, a fact which they ought to remember, and keep themselves abreast with one another in regard to mechanical ideas, and also as to the practical employment of those ideas in their work. He was very glad that since he was last with them, the Society had increased both in numbers and influence, and he desired to congratulate the Manchester Odontological Society on the position it now held. (Applause).

Mr. SKIPP had been told by a rubber manufacturer, that oxide of antimony was mixed with the gutta-percha to give it a body. He thought this might perhaps be of service in using up old and soft gutta-percha by restoring to it something of its original quality.

Mr. DYKES in replying said that Mr. P. Headridge had complained that he could not get the composition soft enough to take a fine impression. That was not his experience, as he could get the composition to any softness he required. He did not wish to say anything against plaster of Paris, but he maintained as good an impression as any could be obtained in the way he had mentioned. He always found the white rubber used in the place of molars to last long enough for the patients to get quite accustomed to the teeth when they ceased to complain of the noise. During the first five years of his practice he never made a set of teeth without springs, and was still of opinion that there were cases in which they might be very useful. He was of Mr. Jones's opinion namely, that if springs were a modern invention they would be thought a grand thing. In all cases where he had used aluminium for strengtheners he had never known it to break, and it possessed the advantage of being very light.

The proceedings closed with a hearty vote of thanks to Mr. Dykes for his paper.

Review.

CATCHINGS COMPENDIUM of Practical Dentistry for 1890.

This is intended to condense into book form the various valuable articles on practical points, which have appeared, during the year, in current dental literature, or more correctly speaking, of those journals written in the English language. It is needless to say that there is a mass of very useful matter condensed into a comparatively small space. It is not a book one would read straight through, but one that can be glanced at in the Dentist's idle moments with advantage.

SCHLAFGAS, BY DR. HILLISCHER, published by Wilhelm Frick, Vienna.

Schlafgas is the name which Dr. Hillischer gives to a mixture of Nitrous Oxide and Oxygen gases, ($N_2O \times O$). The present pamphlet deals with Dr. Hillischer's experience with this mixture and gives a record of 917 cases, in which he has administered it for the extraction of teeth. The average quantity of mixture administered was slightly over thirty litres, the smallest dose was eight, the largest was sixty litres. The average duration of anæsthesia was thirty-three seconds, the shortest was ten, and the longest seventy-five. In the former case, that of a woman aged 45, sixty litres were given; in the latter, a healthy man of 65, forty five litres. For dental purposes, Dr. Hillischer used about 10% of oxygen, but in operations on parts, further removed from the central nervous system 25% can be used. As against N_2O , he regards the mixture as specially indicated in patients, the subject of heart disease, or with atheromatous vessels, to whom the high blood pressure caused by N_2O would be specially dangerous, in these cases he increases the proportion of Oxygen to 15%. He also believes there is a marked lengthening of the period of anæsthesia.

THE MEDICAL ANNUAL FOR 1891, published by John Wright & Co., of Bristol, and Simpkin, Marshall, Hamilton, Kent & Co. of London.

For the ninth time this useful index appears, and will, we are sure, be gladly welcomed. The articles, which it contains, are written by men eminent in their various departments and

are of two kinds :—1st. a brief recital of the work done in a given subject during the year, and 2nd. short monographs. Of these latter, that a “The Hand as a diagnostic factor in Disease of the Nervous System,” is probably the most important. Dental Surgeons will find this book of distinct value as a means of enabling them to make a brief survey of the advances made in other branches of Medicine and Surgery. At the same time such notes as that of Dr. Greville Mac Donald’s on Empyema of the Antrum, cannot fail to be of personal use and interest to them.

Dental News.

THE HOSPITALS COMMITTEE.

At the meeting on *March 5th* Mr. CONRAD W. THIES, the secretary of the Royal Free Hospital, stated that medical students were attached to the London School of Medicine for Women, and only came to the hospital for clinical teaching. It was an entirely free hospital. The governors had no privileges. There were 160 beds in the hospital, and the working average numbered 135. All cases except infectious diseases were admitted to the hospital. During the last cholera epidemic in London the committee threw open the doors of the hospital, entirely free, for cholera patients, and a large number were admitted. The hospital was very popular, and large numbers of persons passed the doors of other institutions and came to it. With regard to inquiries as to the circumstances of patients treated, a system of tickets was adopted for the out-patient department ; 25 tickets were distributed for admission to the medical, and 30 for the surgical side. Last year the annual subscriptions amounted to £1,013 3s.; the donations (including alm boxes at the hospital) £2,253 16 11d; dividends on invested property, £934 12 5d. ; receipts from the Nurses’ Training School £625 5s., and that included probationers’ fees ; and with other miscellaneous receipts the total ordinary income was £6,048 17s. Legacies were received last year to the amount of £6,855 14s., showing a total income from all sources £12,904 11s. The average ordinary income for the past ten years was £5028, and from legacies £7,370, showing a total average income of £12,398. The expenses

last year were £16,671 17s. 4d. Last year they were fortunate in getting £3,500 out of the Court of Chancery. The total of their investments amounted to £20,931. They were not in the habit of appealing, but the committee were now making a special appeal for the express purpose of completing the buildings of the hospital, as increased accommodation was very much needed. The lady superintendent was the head of the nursing staff, and received £100 a year with board and lodging. Besides the lady superintendent, there were 40 nurses, consisting of 10 fully trained staff nurses in charge of wards, 8 nurses in their third year, 15 probationers in their second year, 5 in their first year, and two paying probationers. There were 27 engaged in the day and 13 on night duty. The nurses were trained at the hospital. There was one nurse to every 3.35 patients. The nurses were paid as follows : £26 for the first year and £5 bonus, £28 the second year and £10 bonus, £30 the third year and £15 bonus, and £30 the fourth year and £20 bonus. The salary of the probationer was £10 for the first, £14 for the second, and £20 for the third year. The nurses on day duty worked from 7 A.M. until 8.30 P.M.—13½ hours, but every nurse had a total of 4½ hours off, so that they were working 9¼ hours. They further had 4 and 6 hours off every month, and also 3 weeks' holiday during the year. The average of illness among the nurses for the past 4 years had been very slight, there having been only 4 cases. There were no ward maids, but every morning scrubbers came in and did the heavy work. The lady superintendent practically appointed the nurses, but she reported to the board. There was a non-resident chaplain who was paid £100 a year. The senior resident medical officer receives £100 a year, with board and lodging, and their appointments are temporary, for six months. His own salary was £230 a year, and he had lunch at the hospital. The hospital stood on its own freehold, and was insured for £35,000.

Mrs. GARRETT ANDERSON said she practised medicine, and she was the dean of the Ladies' Medical School at the Royal Free Hospital. The ladies paid fees—£110 for the school and hospital instructions, and £70 of that went to the school and the rest to the hospital funds. There were 107 students, and that was an increasing number. Last year's entry was the largest, and there were 34 new students at the beginning of October. This was the only hospital in England where

ladies studied medicine, and was the only ladies' medical school in England. A very small number had passed the M.D., but a considerable number passed the M.B. examinations, and that was a high qualification. There was not at present a midwifery department at the Royal Free, but it was most desirable that there should be one. The medical profession was becoming lucrative to ladies. The number of female medical practitioners was yearly increasing. At the New Hospital for Women the ladies performed operations. She was in favour of special hospitals. The New Hospital for Women was the only place where women had public hospital practice on a large scale. The lady students at the Royal Free attended operations. She was strongly in favour of the out-patient departments of hospitals.

Dr. CALVERT, M.D., M.R.C.P., Assistant-Physician at the Royal Free Hospital, said he did not consider the charity abused in connection with the out-patient department. Many of the patients who came, if not treated at the hospital, would, he believed, have to go to the workhouse.

Mr. JAMES BERRY, surgeon of the Royal Free, stated that it was essential that schools should be attached to hospitals, at least for the latter portion of the education of the students. The preliminary education might be obtained elsewhere than at the hospital schools.

Dr. FREDERICK ALDERSON, a general practitioner at Hammersmith, stated that he had been house-surgeon and was on the Managing Committee of the West London Hospital, as well as house-surgeon of other hospitals. He considered the continuous free treatment at hospitals injured the outside practitioners. The charities of London were no doubt abused. That general opinion was based on his own experience, having suffered indirectly from it. The special hospitals were very much more abused than the general hospitals. It was almost impossible to prevent it under the present system. He did not consider that he was starved by the hospital system, but it militated against deserving young men obtaining practice. He was in favour of there being a sufficient number of out-patients necessary for medical instruction. He could not speak too highly of hospitals, but he thought they were for the purpose of providing for the poor. In the case of persons who are able to pay, if they were treated at charities they should be made to pay.

OBITUARY.

It is with extreme regret that we announce the death of Augustus Cronin, L.D.S.I., on the 7th March, aged 49 years, at his residence, 26, Harley Street, Cavendish Square, London. He had been in failing health for a considerable time, and retired from practice in October, 1889.

Formerly a pupil of Mr. Owen, of Islington, he afterwards pursued his studies under Mr. A. J. Woodhouse. Of late years he held the appointment of Dental Surgeon to the London Homœopathic Hospital. He was for many years a member of the Odontological Society, and also a member of the British Dental Association. All who knew him must regret the loss of a most agreeable and sincere friend.

WE record with regret the death of Dr. J. S. Crapper, of Hanley, after an illness of a painful nature and of considerable duration. He was a Licentiate of Dental Surgery, R.C.S. Ireland. Dr. Crapper was the founder and the managing director of the Dental Manufacturing Company (Limited), London and Manchester. During his residence in Hanley he has always been esteemed for his social qualities. While fond of the pleasures of life himself, he was not unmindful of the comfort of others, and during the time he was a member of the Board of Guardians of Stoke-upon-Trent, and since then also, he contributed to the entertainment of the inmates of the workhouse, and on many occasions secured for the workhouse boys a visit to Hanley and a plunge in the public baths, superintending the arrangements himself, and refreshing the youngsters at the White House before sending them back to Stoke. Crapper was a magistrate of the borough of Hanley from 1875. He served for a few years only as a member of the Town Council. Besides being an occasional contributor to the Dental Journals. Mr. Crapper published in 1879 a brief History of the Ancient Corporation of Hanley. Mr. Crapper always manifested great interest in the science classes established by the committee of the Potteries Mechanics' Institution, and was a regular attendant at the lectures which that committee from time to time provided. He was the oldest member of the Menturia Lodge of Freemasons, having been initiated on the 3rd of October, 1854. He was W.M. of the lodge in 1862, and he was appointed P.A.C.D. of Staffordshire in the following

year. He never abated his interest in the meetings, and festivities of his mother lodge, and the last time he left his own house it was to attend the monthly meeting of the members of the craft. Mr. Crapper was 66 years of age, and he leaves a widow and one son. His death has caused a general feeling of regret amongst all classes who knew him.

DISCLAIMER.—We have received a letter from Mr. H. F. Partridge requesting us to correct a statement in our issue of 2nd ult. (p. 209). The paragraph which mentioned that Mr. Partridge had left his practice for eight years, was copied from the *Period*. Mr. Partridge informs us that he has never left it, and says that the quotation contains as "Statements which are entirely false," and which he considers "most damaging. As our object always is strict impartiality and absolute reliability, we have pleasure in placing this matter on a correct footing.

APPOINTMENTS.

Mr. Wm. Hutchinson L.D.S. Glasgow, has been appointed Hon. Dental Surgeon to the Loughborough District General Hospital and Dispensary.

Mr. J. A. Gartley, L.D.S., has been appointed Honorary Dental Surgeon to the French Benevolent Society.

Messrs. Briault, Arthur Colyer, W. H. Dolamore, and Percy Smith have been appointed Demonstrators at the Dental Hospital of London, Leicester Square.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

THE ARTIFICIAL TEETH SUPPLY AT THE LONDON DENTAL HOSPITAL.

To the "Editor of the British Journal of Dental Science."

SIR,—I should like to make a few remarks upon a subject which is now interesting a great number of struggling members of the dental profession; I allude to the recently adopted practice of the "London Dental Hospital" of supplying artificial teeth. I would premise these remarks by saying that I with others feel the greatest confidence in the well meaning of the governing body of that institution, though consisting as they do of the élite of the pro-

fession, far removed from the common cares of making a living, they cannot I fear, fully sympathize with the troubles of their less successful brethren.

In the report of 1890, they announced their resolution of supplying artificial dentures to the *necessitous poor*! In a hospital letter, which I have before me now, that term is changed to *necessitous classes*! a distinction easily explained when one reads in the same letter the terms upon which these teeth are supplied: the *minimum* being £4. os. od. for an upper and lower denture, and £2. os. od. for an upper or lower denture (which I suppose applies to a partial or full case), a price far above the necessitous poor! and one at which many respectable dentists would be only too glad to supply them without any pretence of charity in the act! I don't know the exact number, but I am told that a great many cases have been supplied, and that the mechanical department of the hospital is in a very flourishing condition.

There is in the letter a regulation that no money shall be paid by the patient, but only by a donor or subscriber to the hospital, but I think very few of us can believe that these individuals are generous enough to pay the £2. os. od. or £4. os. od. out of their own pockets, but make pretty sure of their own repayment from the patients, now Sir, I would ask is there not more than a fear that these patients are thus taken out of the reach of our honest but struggling neighbours who are unable to compete with the name and reputation of this well known institution?

The thing is as yet in its infancy, what will it be when the other hospitals follow the example? Apologizing for the length of this letter,

I am Sir, Yours faithfully,

London, March, 1889.

H. C. C.

HYPNOTISM OR ?

To the Editor of the "British Journal of Dental Science."

Dear Sir,—It may be interesting to some of your readers to hear of a new anæsthetic, which seems to be a cross between Hypnotism and Mesmerism. I have already, some years ago given you an account of a similar case:—

A lad, aged about twelve, came to have a lower permanent molar removed under nitrous oxide gas, he having experienced no pain during the operation, then succeeded in persuading his brother, who was a weakly boy, to undergo a similar operation, but his medical man advised against his having gas. I therefore resolved, with the parents' consent, to practise on him, what I called a humane fraud. Seating him comfortably in the chair, and placing a Barth's face-piece on his mouth, I told him to go to sleep, I allowed him to take several inspirations of ordinary atmospheric air, and then, when he had begun to snore, I removed the face-piece, and extracted the first permanent molar. Though I had used no nitrous oxide gas, his reply to my question, "Did you feel it?" was "No, I thought it was the other boy having it out."

The second case is that of a young lady who, a few weeks since, wished me to remove a lower molar under gas. I proceeded to administer it to her, from a small gasometer, but after several inhalations I found the top part of the gasometer did not descend, I imagined the counter weights must have become entangled, but on examining the patient I found she appeared to be quite anæsthetised. I therefore extracted the tooth. On recovering the patient assured me she had felt no pain, and added, "I will never have a tooth out without gas again." I was considerably astonished to find afterwards that the reason the gasometer did not descend was, that I had omitted to turn on the tap leading from it to the facepiece. Evidently the patient had no gas.

I should hardly expect these facts to be credited, were it not that he attendant, who was in the room, is prepared to vouch for them.

I am, dear Sir, Yours faithfully,

Margate.

APPLEBY KING, L.D.S.I.

British Journal of Dental Science.

No. 558. LONDON, APRIL 15, 1891. VOL. XXXIV.

ASSOCIATED AND RELATED OCULAR AND DENTAL DISEASES.*

By W. JOB COLLINS, M.D., M.S., B.Sc., F.R.C.S.
Ophthalmic Surgeon to the North West London and Western
Ophthalmic Hospitals; Surgeon to London Temperance
Hospital.

THIS communication is the result of a request by my former colleague, Mr. Maggs, that I should read a paper before your Society. My work for the last ten years having been largely in ophthalmic practice, I was led to think of those points where your specialty touches mine. I am fully aware this subject has been brought to the notice of this Society in a paper communicated by Mr. Power in 1883, and which occasioned a valuable discussion. This paper was declared by one of the speakers to be "the most complete collection of facts bearing upon this important subject which had yet appeared in the English language," and by others to deal with facts hitherto little known or inadequately appreciated.

In the remarks which I offer to-night on associated and related ocular and dental diseases, I do not lay claim to be either comprehensive or dogmatic, but rather suggestive and critical. My attention was early directed to the alleged relation of dental lesions and eye diseases, chiefly by Mr. Power, whose house surgeon I was at the time he read you his paper; and I have kept myself keenly alert to discover the truth about the relationship during the eight years which have since elapsed, and during which I have been engaged in the ophthalmic practice of four or five different hospitals.

* A paper read before the Odontological Society.

Logically, it is no easy matter to establish conclusively a causal nexus between ocular and dental diseases. Bain truly observes, "nowhere more than in medicine may laws of causation be defeated; there is rarely such a thing as a simple cause yielding a simple effect. Hence the necessity of ascertaining whether a coincidence is more frequent than would be accounted for by chance." The elimination of such chance is sought in statistics. Thus Power says, "I have noticed that a large proportion of the children who have phlyctenular ophthalmia also have carious teeth; surely this is very suggestive of the ætiology of the affection." He states his belief in a casual connection between the two; yet on another page he recognises the ambiguity of such conclusion, owing to "the extreme frequency with which dental affections present themselves." Here, then, statistics are of little avail, and we are compelled to resort to a deductive method of proof, and invoke the aid of a judicious empiricism. Beyond a general notion that phlyctenulæ are herpetic, and that herpes is somehow neurotic, associated somehow with dental irritation, there is probably little basis for any such idea.

On the other hand Hutchinson, from an examination of 102 cases of interstitial keratitis, was able to arrive at the induction that this disease was due to inherited syphilis, and was very frequently accompanied with a characteristic physiognomy and definite dental irregularity. The same author's demonstration* of the remarkable concomitance of laminar cataract, defective enamel, especially of the first molars, and Arlt's connection of the former with infantile convulsions, is not less suggestive of some underlying relation between ocular, dental and general nutritional aberration. Whether the claim of relationship is that mercurial powders given for the convulsions cause the dental peculiarities, while the cataract is referrible to the convulsions, and not to the mercury is, to say the least, very doubtful.

When we come to cases where far commoner and less specific dental disease exists as a possible or part cause in some lesion of the eye, we can only proceed upon known anatomical lines and proved physiological facts.

Apart from such cases as antral disease, which places teeth and eye in direct pathological relation, we look to the inner-

* Path. Soc. Trans., vol. xxvi., p. 235.

vation of the respective organs as affording a bond of connection. Bearing in mind the destination of the whole of the second, third, fourth, sixth, and parts of the fifth and seventh cranial nerves, together with the sympathetic supply to the eye and orbital contents, eyelids and muscular appurtenances, and the associated rich innervation of the teeth by the other two large sensory divisions of the great trigeminal nerve, we cannot fail to appreciate the opportunity of intercommunication afforded. Accepting the truth which physiology teaches of reflex action, of transference, of radiation, of so-called "sympathy" we are led to expect, *a priori*, that under certain circumstances conditions must arise in which afferent impulses ascending the dental nerves shall manifest divers sensory and motor phenomena in the complex system composing the organs of vision.

There are affinities developmental, histological and general between the eyes and the teeth which must not be lost sight of when taking a broad view of the two factors whose interaction we seek to investigate.

Developmentally, an analogy by no means fanciful may be found in the fact that with the eyes, as with the teeth, an epiblastic invagination cooperates with a vascular mesoblastic intrusion in the genesis of the organ. A liability to sympathetic tendencies and lesions may thus be laid at the outset. The connecting link of non-vascularity of the dentine and enamel and cornea and lens—a peculiarity shared by the other epidermal appendages, such as skin, nails, hair, scales and feathers—is worthy of remark. The correspondence of the two sets of phenomena may be less true in point of time than in essence, and in their later life histories there is little of analogy between the cyclic changes of the two dentitions and the age changes which eventuate within the eyes.

No doubt it would be possible, though hardly profitable, to discuss my subject by proceeding *seriatim* through the twenty-two pages, ninety-eight genera (to say nothing of species) of diseases of the eye, and the seven pages, thirty-seven genera (to say nothing of species) of diseases of the teeth set forth in the revised nomenclature by the Royal College of Physicians; and then, by the aid of catalogues and indexes, and the ransacking of medical reports and transactions, to cite recorded cases of alleged inter-dependence of every one of one series with some one or other of the other series. I respect the honour of addressing you too highly to presume upon your patience to that extent.

A more practical line of approach would be to classify all associated and related ocular and dental lesions into (1.) Those due to direct pathological sequence, of which antral abscess from dental caries and necrosis with orbital cellulitis,* or an antral tumour causing proptosis,† may be taken as a type, and (2.) Those due to indirect pathological sequence, almost necessarily nervous in its mechanism, of which certain spasmodic affections of muscles of the eye may be taken as constituting a typical group. Alongside and outside this dichotomous division would be associated tooth and eye troubles from developmental causes, diathetic causes, morbid or other selective influences excited by virtue of histological or nutritional affinity.

Following this broad outline, I shall lay before you some cases, of which I have collected notes during the past ten years, some cases recorded by others, which help to complete the exposition, choosing such only as are recorded with critical care and sufficient fulness.

Many cases of the indirect class, especially such as were recorded before the days of the ophthalmoscope, and before Donders demonstrated the pathology of concomitant squint—which means before the early sixties—are of little value. Some are truly miraculous, and may be regarded as apocryphal. Some recorded as reflex amaurosis may be more reasonably regarded as coming under the first class of direct inflammatory extension. The case which Sir Wm. Lawrence,‡ in his “Diseases of the Eye” and Mackenzie, in his large work, quote from Galenzowski, and which Mr. Power told you he considered to be the most brilliant and complete on record of reflex amaurosis from irritation of dental branches of the fifth, may be a case in point. It was that of a man aged thirty, in whom a splinter of wood had perforated the fang of the first left upper molar, which was carious; swelling and pain of the cheek of that side occurred, and later on mydriasis and blindness, which is said to have been complete; this lasted a twelvemonth, when the cause was detected by Galenzowski and the tooth with splinter removed, and restoration of sight quickly ensued. There is history in this case of repeated discharge of spoonfuls of pus in the neighbourhood

* S. Snell, *Trans. Ophth. Soc.*, vol. x., p. 51.

† Mr. Lloyd Williams' case, *Trans. Odont. Soc. of Great Britain*, vol. xxii., No. 2, p. 49.

‡ Lawrence, “Treatise on Diseases of the Eye,” 1854, p. 616.

o lower eyelid, probably from empyema of the antrum, with necrosis of the orbital plate. Galenzowski, who relates the case (*Archives Generales de Med.*, tom. xxiii., 1830) seems to admit this, but concludes from the case that the fifth nerve (as Magendie taught) participates in vision and supplies motor power to the iris! Mackenzie,* who in citing the case, magnifies the intruding splinter from three lines to three inches, puts it down apparently as reflex retinal congestion. The possible effect of a orbital cellulitis directly upon the optic nerve and the striking and rapid improvement of sight after evacuation of inflammatory effusion is well shown in a case recorded by Mr. Critchett in *Ophthalmological Transactions*, vol. vi., p. 155, to which I shall again allude.

I would remark here that, notwithstanding a fairly abundant literature of a not very precise or definite sort, rather of what may be termed the "fluffy" order, cases of definite ocular disease for which a dental cause can be satisfactorily established are very decidedly rare. I have searched the ten extant volumes of the Ophthalmological Society in vain for a clear case of the kind I class in my second group. I find a case of fatal orbital cellulitis resulting from periodontitis and necrosis of the jaw.† I find associated neuralgia or anæsthesia of the fifth, with ocular troubles (vol. viii., p. 254; vol. v., 193), and a reference to a possible dental cause of herpes facialis (vol. vi., p. 400); but no reflex amaurosis, no phlyctenular ophthalmia, no glaucoma, no ophthalmoplegia, no failure of accommodation attributed with any assurance or proof to dental lesion.

Now Mr. Power's comprehensive paper,‡ which laid under contribution most of the available literature on the subject up to that date, yet only contained two detailed cases which had come within the author's own experience. One was a young woman with neuro-paralytic ulcer of the cornea, who was in St. Bartholomew's Hospital when I was house surgeon, and of which I took full notes; she had corneal anæsthesia, and ulceration with hypopyon, and though it is true there was some improvement after taking out some teeth, yet the eye subsequently had to be abscised. The other case was one of double glaucoma, in which a cystoid cicatrix followed each

* "Diseases of the Eye," 1854, p. 1078.

† Vol. x., p. 54.

‡ Trans. Odont. Soc., vol. xvi., 1884, pp. 11-56.

iridectomy, and both eyes were lost. She had had toothache, "and an abscess was always found to exist at the root." I do not gather that Mr. Power either suspected or asserts dental cause in this case, nor does our extending knowledge of the pathology of glaucoma suggest it as likely. Indeed, Mr. Priestly Smith, by measuring the tension of the eye in cases of toothache at the Dental Hospital, found no reason for thinking that toothache affected ocular tension, and though his observations were but few, yet there seems good ground for his conclusion "that the part played by ordinary forms of facial neuralgia in glaucoma is not of primary importance."[†]

In the full and valuable discussion which followed Mr. Power's paper, I can only find records of eight cases of oculo-dental lesion contributed by the sixteen speakers. Mr. Smith Turner related a case of amaurosis from antral abscess. Mr. Charters White mentioned a case of keratitis with a carious bicuspid; Mr. Coleman amaurosis from pivoting a left upper central, and added conjunctivitis was the commonest ophthalmic trouble resulting from dental irritation. The amaurosis case appears to be the same one referred to on page 21, vol. xix., of the *Odontological Society's Transactions*, where it is stated by Mr. F. J. Bennett, on the authority of Mr. Lawson, that the ocular trouble was iritis and in no way due to reflex dental irritation. That conjunctivitis is the commonest ocular affection associated with diseased teeth I have no doubt, for it is the commonest ocular disease, and carious teeth being common too, it is not uncommon to find the two commonplaces in the same person; but surely coincidence and not causation is responsible for such occurrence. Mr. Macnamara, an ophthalmic surgeon of large experience both in this country and in India, could not say that he had ever met with disease of the eye due to dental irritation.

Mr. Spence Bate related a case of neuralgia in the eye relieved by the removal of carious upper molars. Mr. Gibbons told of a case of amaurosis "most marvellously improved" after removal of teeth with exostosis. Mr. A. Coleman had seen a case of malignant disease of antrum accompanied by toothache and failing sight. Mr. C. Tomes had himself experienced supra-orbital neuralgia and appearance as of "looking through running water," coincident

[†] "Glaucoma," 1879, p. 10.

with aching of some upper stumps and cured by their extraction. A possible explanation of this would be a radiation through superior dental to super-orbital and lacrimal branches of fifth. Mr. S. J. Hutchinson referred to a case of lagophthalmos in a lady who had disease of molars on same side. From a subsequent report (vol. xviii., p. 7), we learn improvement followed the removal of the upper first molar, which had been imperfectly stopped. Reflex irritation of the third nerve was here diagnosed, though in the absence of spasm of any of the other four muscles supplied by this nerve, and from the description of the case, I would suggest that spasm of the muscle of Müller, the unstriped fibres of the orbit supplied by the sympathetic, is possibly a more likely explanation.

Dental surgeons are evidently on the alert for cases of the kind of which I am speaking, yet the records in your *Transactions* are few and far between.

Mr. Henry Sewill, the same night as Mr. Power's paper,* related a most interesting case, which was the only case of the kind he had seen, and which he reproduces in his work on "Dental Surgery." It was a case of spasm of the orbicularis, neuralgia, and cataract, apparently due to tender, carious and much neglected teeth on the same side. Appropriate treatment of the teeth cured the spasm and neuralgia, but of course not the cataract.

A similar case of facial spasm, with closure of the lids and neuralgia, due to caries, with abscess of the upper molars of same side, is recorded by Mr. W. C. Boyd Wallis, in vol. xviii., p. 173, of *Odontological Society's Transactions*.

On Dec. 6, 1886, Mr. Hern communicated to this Society† a case which I sent to him from Mr. Lawson's out-patients at Moorfields, in which I suspected that severe localised supra-orbital neuralgia, and possibly the diplopia which was present, were due to carious upper molars of the same side. The removal of the second and stopping of the third molar cured the neuralgia, though the diplopia continued when looking down two months afterwards.

Mr. Newland-Pedley, speaking on this case, wisely cautioned against too great eagerness to trace "amaurosis" to bad teeth, relating a case in which such relation was suspected, but which proved on investigation to be due to malin-

* Trans. Odont. Soc., vol. xvi., p. 8.

† Trans. Odont. Soc., vol. xix., p. 18.

gering, the sight being excellent. I have known several such, even in young persons, where the assertion of blindness of one eye was as obstinately alleged as it was distinctly disproved. No doubt in preophthalmoscopic and less critical days such cases would pass as "amaurosis," which then meant little else than that patient and oculist alike saw nothing, and in which the moral effect of extraction without an anæsthetic no doubt produced very rapid and startling cures.

I have not found in your *Transactions* of recent years any further cases bearing upon my subject, although the valuable communication by Dr. Ferrier "On some Relations of the Fifth Cranial Nerve," viewed in the light of Gaskell's research, suggests some of the paths of inter-communication by reflexion and radiation.

In the discussion which the pathology of sympathetic ophthalmia has occasioned it has been recognized that a nerve, besides establishing a conductive relationship between parts, may also by virtue of its lymphatic sheath, or possibly its more essential structure, afford a path for the propagation of an inflammatory process, whether we consider this of bacterial origin or not. The other theory of sympathy, viz., an identity of action towards some selective morbid poison administered to like parts, is less applicable to the subject in hand unless indeed the "rachitic" and syphilitic teeth on the one hand, and cataract and keratitis on the other, own some such subtle link.

Dealing first with cases of ocular troubles from direct pathological sequence starting from dental causes I may quote the following from my note books :—

Edith D., aged six, with irregular carious primary molars, and ulceration and necrosis of alveolus of the superior maxilla, suffered from what was called erysipelas of that side of the face, with much swelling, proptosis of the globe and chemosis of conjunctiva ; there was said to be dimness of vision, but no neuritis was observed. An incision in the orbit through the lower eyelid let out $\frac{3}{4}$ of pus, and the symptoms rapidly subsided. I have notes of two similar cases ; in one the pus was intensely foetid ; in the other necrosis of the margin of the orbit followed, and some ectropion from adhesion to bone resulted, and required operation. A fourth case, in a woman aged twenty-three, was complicated with syphilis and gummateous nodes within the orbit and necrosis of superior maxilla, neuro-retinitis, resulted with complete optic atrophy

Salter* relates a similar case in which the floor of the orbital with the infra-orbital canal came away as a sequestrum. Pollock, Bruck† and Gaine‡ have also recorded instances of amaurosis from orbital cellulitis, arising from antral abscess or periodontitis and maxillary periostitis secondary to carious teeth. Snell has published three cases recently, one of which terminated fatally. Critchett had a somewhat similar case in which there was great proptosis, free incisions only evacuated serum but gave great relief, and vision, which at one time was quite lost, completely returned; the other eye went through something like a sympathetic iritis. A year later another attack threatened, but extraction of a painful tooth appeared to cure it, then for the first time it was discovered that the patient, a girl aged sixteen, still had eleven of her second upper set still uncut.

Tumours, innocent and malignant, involving the antrum, and osseous growths in leontiasis ossium, of which I have noted two cases, may occasion ocular and orbital neuralgia, displacement of the globe and diplopia, and even optic atrophy.

A case I watched with close interest may serve as a transitional one to the indirect group. J. G., aged fifty-eight, suffered intense trigeminal neuralgia on the right side. Yet on testing it was found he had anæsthesia of all the parts supplied by the three sensory trunks of the fifth, including the eye, nose and mouth. There was no conjunctivitis, the pupil dilated to nearly twice the size of the fellow; the lens exhibited a diffuse nuclear cataract; the cornea, though quite anæsthetic, was perfectly clear, and remained so for some months. He had some carious stumps on the right side which were extracted by my then colleague, Mr. Maggs, without pain or benefit. Later the cornea clouded, and there were the appearances of neuro-paralytic destruction of the globe. The pain was markedly relieved by stretching the superior maxillary nerve, which I performed without an anæsthetic. Later I excised the right eye, also without an anæsthetic and without the least pain. There was no palsy of the motor portion of the fifth. I diagnosed a lesion in the Gasserian ganglion, or nuclear. I cite the case as showing the projection of pain at some distance from the lesion, and a probable relation between an irritative lesion of the fifth and cataract,

* Salter, "Dental Pathology and Surgery," 1874, p. 273.

† *Annales d' Oculistiques*, 1859.

‡ *British Medical Journal*, part cclxi., p. 683.

as well as the more recognised corneal troubles. This case lends support to the one of Mr. Sewill's in which neuralgic blepharospasm and cataract resulted apparently from irritation of the superior dental nerve.

I have notes of several cases of tonic trismus from spasm of the masseter and temporals due to imbedded wisdoms; this is a well-recognised reflex spasm, I believe, but I refer to it as helping to elucidate orbicular spasms from dental irritation. Irritation of sensory branches of the fifth may occasion either radiation of neuralgic pains to other branches of the same cranial nerve, as in localised supra-orbital neuralgia in Charles H., whom I sent to Mr. Hern for extraction of offending upper molars, or so-called reflex spasm, when motor branches of the same nerve are affected, causing spastic contraction of the temporals and masseters. It is only a short step from this to facial spasm, or spasm of the external rectus, the seventh and sixth nuclei being in close company with the motor root of the fifth in the pons Varolii.

Amelia D., aged sixty, had intense tonic spasm of the left orbicularis palpebrarum, with clonic exacerbations, which also partly involved the other muscles of that side. I found a painful carious canine, pressure upon which was acutely tender, and intensified the spasms. I advised removal, but regret she did not return to report the result. Mr. Boyd Wallis' case reported in vol. xviii. of your *Transactions*, p. 173, appears to be of the same class as this. I have seen at least six or seven such cases, and have for some years pointed out the dental causation of blepharospasm.

Emma Shaw, aged twenty-five, complained in March, 1885, that for six months the right upper eyelid had been refracted, showing the sclera above the cornea. The eye could be closed easily, but in ordinary states a peculiar staring appearance resulted. This she dated very emphatically from the extraction of some other teeth of the same side, which occasioned great suffering. There was slight enlargement of right lobe of the thyroid, and I was inclined to regard the symptoms as due to irritation of the cervical sympathetic, which supplies the muscle of Müller, contraction of which (as we may see in the cocaineised eye), produces lagophthalmos. Mr. S. J. Hutchinson's case, which I have referred to, seems to me a parallel case.

I have never seen a case of glaucoma, acute or chronic, which appeared to be in any way caused by disease of the

teeth ; though of course neuralgia of the head and cheek is common enough in such cases. I remember a curious case of intense supra-orbital neuralgia which was puzzling ; later, however, the neuralgia gave way to total anæsthesia over the area of distribution of the supra-orbital nerve. On deep pressure a lump was felt, evidently involving the supra-orbital nerve trunk : this was removed, was as large as an almond, and was composed of granulation tissue ; there was a history of syphilis, and it was possibly a node.

I have paid a good deal of attention to failure of the accommodation, and, notwithstanding the statements of H. Schmidt, I much doubt whether dental neuralgia has any other effect in this direction than that of general depression, and consequently, as with so many other depleting causes, as blood losses, the puerperal state, hyper-lactation, convalescence from exhausting fevers, in a measure restricts the range of accommodation. In sixteen persons suffering from toothache tested by Priestley Smith, fifteen had no anomaly of accommodation.

Nor do I think paralytic affections of the external or internal muscles of the eye or lids are often, if ever, traceable to dental disease. A reflex paralysis presents some physiological difficulties, and a reference to "inhibition," which seems to imply interference with some tonically exerted motor influence, does not elucidate the matter to my mind.

I also must confess to scepticism as to the satisfactory demonstration of cases of reflex amaurosis arising from irritation of the dental nerves, apart from direct extension of inflammation through the maxilla. Such cases become more frequent in literature as we recede into pre-ophthalmoscopic and less critical times, and become rarer and seem to disappear when they are most vigilantly and critically inquired for. The deep origins of the optic nerve, though not precisely determined, would appear to be far removed from the fifth, and the path of such reflex amaurosis becomes proportionately circuitous and improbable.

Of associated ocular and dental lesions, such as keratitis and notched teeth, and lamellar cataract and "rachitic" teeth, every ophthalmic surgeon has abundant instances at hand. I would here remark, however, that it is curious to notice how often many who should know better appear to confound the triple denticles which the permanent incisors exhibit normally when first cut, and which often remain some

years before they are ground down, with the Hutchinsonian notched teeth of hereditary syphilis. It is, possibly, by the defective enamel of the central denticle causing this to be broken away that the notched appearance results, and I exhibit a photograph which serves, I think, to illustrate this process.

I regret that this paper has grown to a length which I did not intend ; I regret that it is open to the objection of being deficient in constructiveness ; I am aware that while some regard all oculo-dental disorders with a wholesome scepticism, others are apt to concede to them undue importance. I have attempted to decide justly between such extremes ; I am led to emphasize the importance of orbital and ocular troubles with direct pathological relation to dental diseases ; to relegate to a less proven category reflex amaurosis and the like while recognising the undoubted existence of certain reflex spasms and radiated neuralgiæ, which oculists must look to the dentists to explain and cure.

SOME REMARKS ON DENTAL THERAPEUTICS.

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GENTLEMEN,—Having promised to read a communication before this Society, it was suggested to me that the subject of Dental Therapeutics would furnish many points of interest for our discussion. But the term Dental Therapeutics is such a large and comprehensive one (including as it does not only the action of the various drugs employed, but also in its widest sense, the use of other remedial agents), that it is at once apparent that only a very few points can be touched upon, in the time at our disposal.

In the first place, I would suggest that more attention might well be devoted to the preventive treatment of dental caries.

And if we are to set about this with the hope of any measure of success, we must at the outset bear in mind the causes of the disease and its pathology. Let me, therefore, for a moment, refer to the present position of this question, which has been the cause of so much controversy, and the present opportunity seems all the more fitting, since we have now fresh in our minds the admirable series of photo-micrographs illustrating the subject which Mr. George Campion showed at our last meeting.

It is ten years ago since Messrs. Underwood and Milles showed that the chemical theory was insufficient to explain the process and pointed out the constant presence of micro-organisms in decayed dentine and the widening of the tubules produced by them. They maintained that "two factors are always in operation (1) the action of acids, and (2) the action of germs, that most probably the work of decalcification is entirely performed by the action of acids, but that these acids are secreted by the germs themselves."

Dr. Miller has carried the investigation still further. He showed that lactic acid is the chief acid formed in the mouth, as the result of the lactic acid fermentation which is produced by the action of several kinds of bacteria, that it is found even in the deepest parts of decayed denture, producing there a clear zone of decalcified tissue, surrounding the infected denture and as yet free from organisms. The bacteria may sometimes make their way into the tubules of healthy normal dentine but "the great mass of bacteria in decay of the dentine does not even penetrate up to the normal dentine, much less into it." And it follows from this that a superficial decalcification, must always precede the actual invasion of the tooth substance by bacteria. He suggests as an explanation of the formation of cavities in caries, the theory that the bacteria effect a peptonising action analagous to the process of digestion, by which the tissue becomes disintegrated.

In a rational system of treatment, then, we must never lose sight of the part played by micro-organisms and just in so far as we are able to destroy the germs shall we be able to control the disease.

And here our difficulties begin; for the mouth of all the cavities of the body is the most difficult to sterilise. It forms indeed a veritable incubator. Heat, moisture and nutriment, the essential conditions of bacterial growth, are present in perfection, and yet that a great deal may be done, can fairly

be claimed. When we consider the extraordinary prevalence of caries in young people, between the ages of, say, 12 and 18 a period during which, as a rule, the thorough and regular cleansing of the teeth is not carried out, and when we notice that afterwards, with the greater care which is usually bestowed, there is a decided decrease in the ravages of the disease, we are driven to the conclusion that preventive treatment is of great importance. And one would, of course, include here the relief of overcrowding of the teeth. Perhaps we hardly emphasize as we ought the necessity for greater attention to the hygiene of the mouth. A thorough mechanical cleansing twice a day is surely little enough, and besides including the use of the tooth pick or floss silk, it might well be followed by the application of an antiseptic mouth wash.

Of antiseptics there is no end, but for one reason or another there are few which are available for this purpose. Some are so poisonous as to be unsafe for general use, as the perchloride of mercury, some are injurious to the soft tissues or the teeth themselves, while others are disagreeable in taste or smell.

Another difficulty lies in the fact that although the antiseptic is easily brought into contact with the exposed surfaces of the teeth, it is difficult to reach the interstices where decay chiefly occurs. And we must also bear in mind that a longer time will be necessary to devitalise germs which may have infected solid particles of food in the mouth than those which are free in the oral secretions. Therefore, the mouth wash is almost useless unless preceded by a very thorough cleansing of the teeth.

This is the reason why the use of tobacco does not materially retard decay; the smoke passes over the exposed surfaces of the teeth, and notwithstanding its powerful action, does not penetrate to the germicidal centres of decay.

The comparative values of some of the most useful antiseptics have been determined with the following results: (the experiments being made with organisms in solutions.) Miller.

		Concentration.	Time necessary for devitalization.
Salicylic Acid	.	1 in 100	$\frac{1}{4}$ min.
Benzoic	„	1 „ 100	$\frac{1}{4}$ „
Listerine	.	.	$\frac{1}{4}$ to $\frac{1}{2}$ „
Bichloride of Mercury	.	1 „ 2500	$\frac{1}{2}$ „ $\frac{3}{4}$ „
Benzoic Acid	.	1 „ 200	1 „ 2 „

	Concentration	Time necessary for devitalization.
Borobenzoic Acid .	. 1 in 175 .	1 „ 2 „
Thymol .	. 1 „ 5000 .	2 „ 4 „
Carbolic Acid .	. 1 „ 100 .	10 „ 15 „

Listerine thus stands high on the list, I have been using it for some time, and find it not unpleasant in taste, besides being perfectly safe.

Miller's formula somewhat resembles it.

R Thymol gr. iv.
Benzoic Acid gr. 45.
Eucalyptol ʒiii grs.
Alcohol ʒxxv.
Oil of Wintergreen gtt xxv.

Enough of this mixture is added to a mouthful of water to produce a decided cloudiness.

To this formula, one grain of the perchloride of mercury may be added, but one would not consider it sufficiently safe for general use.

If micro-organisms are the prime cause of dental caries, it follows that the use of a stopping having antiseptic properties would often be advantageous, and this more especially in those cases where, by accident or design some carious dentine is left behind in the preparation of the cavity.

Most of us, I think, would prefer leaving a thin layer of decayed tissue over a pulp if the removal would endanger its exposure. A filling which would arrest decay in the softened dentine beneath it, would be of great service and would in many cases prevent the disease extending to the pulp itself.

Some interesting experiments have been recorded by Miller to determine the antiseptic action of some of the various filling materials.

On plates of nutritive gelatine infected with bacteria from the mouth, bits of the various filling materials were placed. Those having antiseptic properties arrested the development of bacteria around them as shown by clear spaces in the otherwise opaque and cloudy plate of gelatine.

As would be expected, the best result by far was obtained with copper amalgam owing probably to the formation of a thin layer of the soluble sulphate on its surface.

The oxychloride of zinc had a very marked action when fresh, which it lost after 24 hours.

The oxysulphate seems almost inert ; gutta-percha and tin gave no reaction, resembling in this respect cohesive gold, but unannealed gold cylinders gave good results. A mixture of tin and gold was less active than gold alone. The good qualities of this combination would therefore seem to depend on physical rather than chemical reasons. The strong antiseptic properties of copper amalgam would seem to indicate its use at the cervical edge in many cases of complicated caries extending under the gum and very near the pulp, and a thin layer may even be allowed to cover the floor of the cavity, in order to sterilise the dentine, the rest of the cavity being filled with some other material.

The use also, of antiseptic materials for capping exposed pulps, deserves a thorough trial. The sulphate of copper in combination with gutta-percha or oxysulphate has been already used for this purpose, and by sterilising the softened dentine over the pulp, and preventing the infection of the latter, one cause of mischief arising under fillings might be prevented. The perchloride of mercury may prove equally effective, and without the danger of staining the tooth.

Some doubt has been expressed lately as to the value of Iodoform. On the one hand it has been asserted that many kinds of bacteria actually flourish in it, and that its value is therefore fictitious : on the other hand it is now very generally used in the treatment of wounds, and as an antiseptic and deodorant, it is said to be unequalled. The explanation is really this : it absolutely arrests the putrefactive process probably by destroying the bacterium termo, but towards some other organisms it is inert.

Whenever we have septic material to deal with as in the treatment of dead teeth, we are justified in regarding Iodoform as one of the most reliable antiseptics we possess.

A word as to one or two drugs, commonly prescribed, which are said to be injurious to the teeth. The preparations of iron have been charged with doing a good deal of mischief. There is no evidence at all that the wine of iron is harmful, or the compound iron mixture, or Blaud's pill, in both of which the acidity of the sulphate of iron is neutralised by carbonate of potash, nor again is dialysed iron. The combinations of iron, however, with ammonia and citric acid, and with quinine and citric acid are slightly acid in reaction and to that extent injurious, the tincture of the perchloride of iron, being strongly acid is the most harmful of all. The

tooth which I now hand round has been kept in a solution of the perchloride for a fortnight, and decalcification is well marked.

In taking these preparations the precaution should be observed of using a tube and washing the mouth out before and afterwards, with an alkaline solution.

Salicylic acid, now so much in vogue, acts beneficially on the teeth, in so far as it is an antiseptic, but it will be seen from the specimen I pass round which has been kept in a solution for 7 days, that it has a marked decalcifying action.

In conclusion, gentlemen, it only remains for me to thank you for the attention you have given to these desultory remarks, and to suggest that, difficult though it may be to apply the principles of antiseptic surgery in our practice, we should yet do well to make the attempt in those directions, among others which have been indicated.

THE MOST CELEBRATED TOOTH IN THE WORLD.—It may not be generally known that “the most celebrated relic of Buddha now existing is in Ceylon, namely, the dalada, or left canine tooth, a piece of discoloured ivory two inches long (much too long for a human tooth). This is preserved in a small chamber in the vihara (temple) attached to the old palace of the Kandyan Kings, enclosed in nine successive bell-shaped golden and jewelled cases, each locked, and the key kept by a separate official.” This relic is probably revered by a larger number of people more than any other relic in the world. Taking the two most moderate estimates of writers on the subject of Buddhism, Sir Monier-Williams reckons the number of Buddhists at one hundred millions; but Dr. Happer, an experienced American, estimates that there are only seventy-two and a half millions. Some writers have fixed the number at five hundred millions, but this is now considered a great mistake.

British Journal of Dental Science.

LONDON, APRIL 15th, 1891.

IS AN M.O.S., OR F.O.S. CALLED FOR?

SOME time ago a correspondent drew attention, in these columns, to the meaningless, if not absolutely misleading, use of the letters R.S.D. Of course everyone at all familiar with dental matters knows that this is but an abbreviation of the words Registered Dental Surgeon, it was, however, evidently inferred by our correspondent, that the public might be led to believe it was equivalent, or had some relationship with, the L.D.S., Licentiate of Dental Surgery, and so be held to guarantee a college education, and a certain standard of efficiency. We must confess the offence does not seem to us a very heinous one, for, after all, the man *is* a registered dentist, he *has* complied with the Act, and if he likes to remind the public of this, no one has much right to call his action in question. Seeing, however, that no one can practise without being registered, and that the merit of having got upon the register a few years ago, was, owing to the looseness of the Act, absolutely nil, one cannot see exactly what is the use of the affix R.D.S. We said the offence was not a "heinous one," we must, however, qualify this by adding; if by its use there is no intent to defraud; if there is intent to defraud, then the man passes under another code, and should be tried along with other rogues and vagabonds.

The subject, however, brings before us very forcibly the whole question of the use of letters after one's name. There appears, at the present time, to be a strong desire on the

part of every one, amounting almost to absolute mania, to be able to append the whole alphabet, in irregular order, to one's signature. It is a most harmless amusement, and is so absolutely distinct from laudable endeavours to possess high qualifications and degrees that one may safely speak of the subject, maybe laugh at the craze, without in any way throwing cold water over young aspirants, or calling in question the distinctions of past masters. There are, of course, certain well recognised diplomas and degrees, which in all professional matters should be, and are, publicly announced by adding to the possessor's name the initials of their title ; but even with these the canons of good taste may easily be overstepped. It needs but a most casual observation of the doings of men to show that it is not the really great and learned man, who loves to flaunt his titles and degrees about, but the little man of great ambition but of little worth. The same feeling which forbids a lay gentleman from the use of his University degree should hold with a professional one in his private capacity. But if we turn from the orthodox affixes to the host of irregular ones which we continually see used, our feelings are a mixture of amusement and wonder that any can be found to find pleasure therein. There are certain societies to which it is an honour to belong, the election to which is the crowning point of a man's professional or scientific life ; he has worked for this, or has worked for the work's sake, and the societies have recognised his work by electing him a member. Such an ideal society we find in the Royal Society. But there are a heap of other societies, with a more imposing title than the plain F.R.S., to which the election is more or less formal, and whose membership denotes nothing further than a more or less apathetic interest in the matter with which this particular society is engaged. We cannot, therefore, see what is the use or what is the honour in decorating one's signature with such titles.

Having treated this question from a general point of view, we would say something on the particular instance we have in our mind. From time to time various ideas have been put forth as to the desirability of the members, or, as some would

prefer to call them, fellows of the Odontological Society using the letters M.O.S., or F.O.S., as a kind of ornamental flourish after their signatures. Now, we may look at this idea from two points of view. First, is the membership, a distinction conferred? The answer is most certainly, No! Any dentist who has not raised the personal animosity of a certain proportion of the members can be elected, provided he observes certain professional usages. Second, is the membership a sign that a man adopts a higher standard of professional life? It most certainly is. From the second point of view there would be some apparent meaning in the use of such a title, though from the first there would be none. If, however, we remember that a man practising with a high professional spirit needs no such public sign of his integrity, and that, therefore, its use would be confined to white-washing some of those who hover perilously near the border line, we certainly cannot see that the establishment of such a title is very strongly indicated.

WE are glad to notice our resumès of the foreign dental journals are so appreciated that the *Southern Dental Journal* incorporated one of these in its pages *in toto*. That it forgot to mention the source was probably an oversight or a printer's error. At least, in charity, we suppose so.

WE read that the Odontological Society of New York have purchased Mr. Ward's collection of skulls for fifteen hundred dollars. According to Dr. Barrett, who contributed 100 dols. it is the finest collection of crania in the world. They are expected to form the nucleus of a fine Dental Museum in New York.

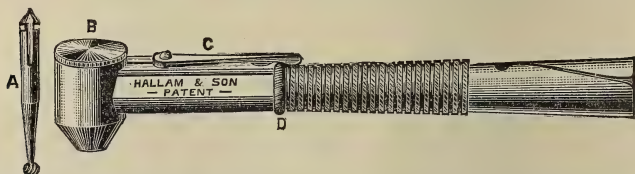
NEWS from the Schools shows that friendly rivalry is the best stimulous to advancement. The National Dental Hospital we hear, is hoping to be in its new home some time during the next year, and we are also glad to learn they have already £7000 towards the building fund. Guy's, also, is building special premises, whilst fresh developments may be looked for

at the London Dental Hospital. This Hospital is beset with difficulties when trying to find room for its great growth. Hemmed in, expansion is prevented; whilst removal from so fine a site would need very careful consideration. We understand that with the appointment of four demonstrators instead of two it is intended to make the instruction to new students much more thorough and complete than has hitherto been the case. Not only will they receive individual instruction, and attend demonstrations as heretofore, but attendance on a course of some twenty-four lectures given by the demonstrators on elementary Dental Anatomy, Surgery and Operative work will be compulsory.

At Dundee there was recently an action in the Sheriff Court, which, though but incidentally connected with dentistry, is yet of some general interest. The case was this. A fireman of the steamer *Amethyst* suffered from toothache and a swollen face whilst the vessel was at Riga. He was consequently sent to the hospital, where he remained a fortnight, during which time the vessel left without him. The man stated that the length of time he was in the hospital was due to maltreatment at the hands of the Russian doctors. Now though the origin of the case was dental, the interest in the case was legal, for the Sheriff laid it down that when the Merchant Shipping Act provided that for a ship to leave a sailor behind in a foreign port, a certificate must be obtained from the British Consul at the particular port, or from two respectable merchants, and that the certificate shall be of unfitness or inability to proceed on the voyage, it meant too ill too travel or suffering from a disease, rendering him unfit to travel in proximity to healthy men. But it did not mean simply that he could not work. In this instance, the Sheriff held that the man would have been better on board than in hospital, even though he could not work, moreover he was not satisfied with the inquiries made to ascertain whether the man was unfit to travel or not. He therefore gave his verdict for the plaintiff.

Manipulative Miscellany.

All new instruments or articles that it is wished to have described under this heading, are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.



MITCHELL'S RIGHT ANGLE ATTACHMENT.

MESSRS. HALLAM & SON, send us a couple of these right angle attachments, for which they claim the following advantages :

1. The bur can be put in and taken out, with less trouble than any other.
2. When in, it cannot come out until released.
3. The bur works more firmly in this than in any other holder, owing to the bur being centred at the end.

A short trial with the instrument suffices to show that these claims are perfectly justified. An idea of the handpiece may be gathered from the print. C is a small lever which, when turned at right angles to the length of instrument, opens a steel spring clip, this grips the bur around the groove, which is represented as encircling its upper end. This allows the bur to be withdrawn, and a new one substituted, the lever is put back parallel with the instrument, the spring clip closes up into the groove, and the bur is firmly held. When working, part of the pressure on the bur is transmitted to the clip, part to the socket in which the bur fits, and which revolving carries the bur with it, and the balance is transmitted to the top of the box B on which the bur rotates on its pointed upper end. Thus the bur runs steadily and firmly.

Abstracts of British & Foreign Journals.

FRENCH DENTAL JOURNALS.

L'Odontologie publishes a paper by M. BARBE entitled, "A NEW METHOD OF OBTAINING PARALLELISM OF PIVOTS," in which he describes an ingenious method of overcoming the difficulty of obtaining perfect parallelism of the pivot pins in those cases in which plates are held in the mouth by two or more such pins passing into roots. He obtains the position of his canals on the plaster model by putting wood or metal points up each root canal fitting loosely. These points are curved and flattened at the end, and held *in situ* by a little wax. They will thus be drawn away with the impression material, and show the position of the canals on the plaster model. In the canal thus made, on the model, he puts metal pins bluntly pointed, the pointed ends projecting slightly above the level of the root. Thus the zinc casts, when made, will have little projections indicating the points at which the plates must be perforated for the pins. He then strikes up two plates, one in gold, the other in German silver. It is evident that if these two plates are perforated at exactly the same spot, and the pins pass through, the separating of the two plates must ensure the absolute parallelism of the pins. In cases in which the roots themselves are not parallel, the canals must be drilled not exactly in the direction of the pulp canals, but to one or other side, as the case may be. The paper is illustrated by a diagram which enables the description to be more easily followed.

In a paper read before the Odontological Society of France on "THE NOSE: ITS ANATOMICAL, PHYSIOLOGICAL, AND PATHOLOGICAL RELATIONS TO THE CAVITY OF THE MOUTH." Dr. JARRIGE lays great stress on the prejudicial effect of mouth breathing caused by obstruction in the nose. The air constantly passing over the mucous membrane, causes it, he says, to become very irritable, and to atrophy. The gum margin is retracted, leaving the neck of the tooth exposed,

and places it in the most favourable condition for promoting pathological changes. He also lays stress on the extension of inflammation from the nose to the ear by means of the Eustachian tube.

M. GODON contributes a short article to *L'Odontologie* on "The possibility of treating dental disease without drugs." This is, as it were, a continuation of a communication made in a previous issue, in which he showed the minute doses of the various drugs employed by dentists. In this present paper he enters a vigorous protest against placing too much reliance in drugs, and insists that operative procedure constitutes the chief mode of action of the modern dentist, and that although certain drugs have their uses, they are not absolutely necessary, and it is quite possible to do without them altogether.

Dr. GALIPPE reports in the *Le Progrès Dentaire* a case of acute rheumatism, confined to the temporo maxillary joint. It occurred in a patient of rheumatic tendency. The symptoms were swelling up the cheek on the right side with redness and pain on pressure ; mastication and talking were both painful, with exacerbations at times. Pressure over the temporo-maxillary joint caused sharp pain. The upper and lower wisdom teeth on the same side felt as if raised in their sockets. There had been no toothache. Careful examination of these teeth revealed no decay. The diagnosis was made of an attack of acute rheumatism in the right temporo-maxillary joint, and the patient was put upon salicylate of soda and sulphate of quinine, a rapid cure resulting. Dr. Galippe considers that the raising of the teeth was due to an attack of rheumatism in the alveolo dental membrane itself, or rheumatic periodontitis, rather than simply the extension of pain from the affected joint.

L'Art Dentaire reports the following case of Salivary Calculus. M. Horteloup was consulted by a gentleman 48 years of age, who complained of having a little tumour

under the lower jaw, which disappeared from time to time. But more recently one could feel in the horizontal portion of Wharton's duct a fairly large calculus, which was a few months afterwards accompanied by a second one occupying almost the whole length of the canal. The canal was cut open and the calculi easily extracted. The two together were about $1\frac{1}{2}$ inches long and were composed chiefly of phosphate and carbonate of lime. Contrary to what is generally seen the large extremity was not turned toward the gland. The rapidity of formation of the second calculus was also remarkable. M. Paulet said he had extracted two calculi from a patient who a year afterwards had the salivary gland full of these calculi.

FILLING TEETH WITH COAL.

In a paper on this subject read before the Dental Section of the International Medical Congress at Berlin, I alluded to the well-known fact that coal powder, employed as a dentrifice, would collect under the free margins of the gums, which thereby became discoloured, but would not be irritated by the long-continued presence of the particles of carbon imbedded therein. It was therefore inferred that coal is peculiarly tolerable to tissues, and being besides in some sort an insoluble antiseptic, its suitability for tooth-canal filling was apparent. Subsequent experience confirmed the deduction.

I have used coal in various forms for filling root-canals, but prefer a manufactured article in the form of felted coal, and one of my methods is as follows: The tooth having been previously subjected to antiseptic treatment is inclosed in the rubber-dam, the root-canals made dry, and then filled with alcohol from a drop-tube or syringe. By this means all air is excluded and the introduction of the coal filling facilitated. A suitable small piece of coal is then taken with the foil-pliers, heated over the annealing lamp flame, and pushed to place in the canal with proper pointed pluggers. These should not be too fine or sharp, but have flat-ended points as large as the canal will admit. The preliminary alcohol injection may be omitted, and the coal used dry and heated. It may be forced into the narrowest canals, and is especially suited to deciduous teeth, as it offers no obstruction to the resorption of the roots. The black colour of coal is objectionable when thin enamel-walls allow it to show through, but in such cases the

discoloration may be prevented by cement protection, or the excess of coal may be washed out with alcohol followed by the warm-air blast. The pulp chamber and crown-cavity are then filled with gold or any suitable material. In large cavities pieces of coal may be imbedded in the cement or amalgam filling. The permanence, non-irritability, and antiseptic properties of coal under all possible conditions of dental uses render the material valuable for many purposes in dental surgery. As a vehicle for every class of medicaments applicable to exposed pulps, suppurating surfaces, or accessible alveolar abscesses, coal in the mat or felt form is invaluable, and it affords me great gratification to bring it to the notice of the profession.—DR. ELOF FORBERG, Stockholm, Sweden.
(*Cosmos.*)

AMALGAM AS AN ANCHORAGE FOR GOLD.

C. J. PETERS, D.D.S., has had considerable experience in the use of amalgam as an anchorage for gold. "It is useful," he thinks, "in teeth having very shallow cavities, and in cases where, while it is desirable to use gold, the edges chip or scale off at every attempt to make the cavity retentive." The doctor's method is as follows; "The cavity being ready, a small amount of cement is mixed and placed in it; on this put a cylinder of gold large enough to cover the floor of the cavity. Then work the gold into the cement, at the same time working the latter all over the cavity. Now, trim cement from the edges, and proceed with the filling, making a mechanical anchorage of the gold with that anchored by the cement." Rubber dam should always be used.

Items of Interest.

OXYPHOSPHATE WITH GOLD OR AMALGAM.—Several years ago we called attention to the desirability, sometimes, of nearly filling a large cavity with oxyphosphate, and then, before this cement has set, pressing in crystal gold. This gold can be added to as the cement hardens, and thus the filling finished with gold. This is much cheaper than an all gold filling, and for frail walls better. A dentist called my attention to a similar practice by himself, that he considers quite an improvement in many instances on all gold. The

oxyphosphate so thoroughly adheres to the walls that it makes, he thinks, a more durable filling than all gold. Capping a large oxyphosphate filling with amalgam is preferable to all amalgam for the same reason.

Items of Interest.

TO SAVE THE EDGE OF STERILIZED INSTRUMENT.—While attending Prof. von Bergmann's surgical clinic at Berlin recently, the following demonstration was made, which will certainly interest your surgical readers.

To render instruments perfectly aseptic, and to preserve the cutting edges from oxidation, they are boiled for five minutes in a one per cent. solution of carbonate of soda. They can remain in this solution indefinitely without rusting or dulling the cutting edge. When required for operation they are taken out, dried with a sterilized piece of gauze, and handed to the operator. Whenever, in course of the operation, they come in contact with any thing not aseptic, all that is required to re-sterilize them is to dip them for a few seconds into the boiling solution of sodium bicarbonate.

JOHN S. MILLER, M.D.

Dental Register.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Ordinary Monthly Meeting, March 2nd, 1891.

Mr. S. J. HUTCHINSON, M.R.C.S., L.D.S., President in the chair.

The minutes of the last meeting having been read and confirmed,

Messrs. H. L. Albert, Theodore W. Harris, T. S. Carter, having duly signed the Obligation Book, were admitted by the President members of the Society.

The nomination of Mr. Beadnell Gill was read before the Society.

Mr. Thomas Maudsley Howkins, L.D.S.I., of Dunallen House, Regent Terrace, Hull, was balloted for and elected a non-resident member of the Society.

In the absence of the Librarian, Mr. STORER BENNETT announced that two donations had been made to the Library, viz.: (a) *Calendar of the Pharmaceutical Society of Great*

Britain, 1891; (b) "*Verhandlungen der Deutscher Odontologischer Gesellschaft*, Band II., Heft 2, den October, 1890" (Berlin, 1891) [No. 2 of the second volume of the *Transactions of the German Odontological Society*, Oct. 15th, 1890].

THE CURATOR (Mr. STORER BENNETT) stated that two upper models had been received for the Museum from Mr. Bulkley Hughes, the first model from a patient aged forty showed two supernumerary teeth erupted in the palate behind the normal incisors, the crown of one of the teeth was cubical and the other cone-shaped. These two teeth were extracted, causing considerable hæmorrhage, and accompanied the model. The second molar showed a conical crowned supernumerary tooth also erupting in the palate, in a boy aged fourteen. This tooth was likewise extracted and sent to the Museum.

Mr. STORER BENNETT related a case of alveolar abscess of three years' duration caused by the perforation of the side of a root of a tooth. He said the case was interesting and instructive for various reasons, for it showed the disastrous consequences which might result from the injudicious employment of a drill for opening up a root canal, which, if it quit the normal channel, might pass completely through the wall of the tooth; and if the nature of the accident escaped recognition at the time, its subsequent detection might become a matter of the greatest difficulty, should the patient pass into the hands of another practitioner for treatment. The history of the case was somewhat detailed, extending over a period of four years, and being under the treatment of four different dental practitioners. In 1886 the patient, a young lady then fifteen years of age, had a right upper lateral incisor filled on its palatine surface. In the following year the pulp became inflamed, and a chronic abscess formed, discharging through a fistulous opening opposite the apex of the root. In 1888 a second dentist was consulted, and he, in order to cure the alveolar abscess, enlarged the root canal and filled it with gutta percha. The tooth now became acutely inflamed, and a profuse discharge of pus escaped through the gum from a second fistula opposite the buccal surface of the root, but lower down than the first one. The case was under treatment for five weeks without relief, when it was necessary for the patient to come to London, where she consulted a third dentist, who appears to have expressed himself very

confidently of his ability to affect a speedy cure. By him, however, the tooth was dressed on alternate days for six weeks when, as no improvement in the symptoms could be detected, he suggested that a consultation was desirable. This was accordingly held, when, after a very careful examination the consultant expressed it as his opinion that the second fistula had no connection with the abscess at the apex of the root; an opinion that subsequent events—and the present specimen—proved to have been absolutely correct. In 1890 the young lady was seen by an eminent surgeon, by whom her trouble was attributed to an abscess in the antrum, a molar was therefore extracted, and the antrum opened through the socket for its relief; no pus however, escaped and at the end of a few days the opening was allowed to close up. The discharge from the lateral incisor continuing unabated, the patient reluctantly consented to the tooth being extracted, when it was seen that in enlarging the root canal the drill had been directed too far forward and so through the buccal wall, while through the false passage so formed a piece of gutta percha protruded. The difficulty of diagnosis of course arose when the false passage being formed was plugged with gutta-percha, for then the usual signs of such an accident were masked by the perforation being blocked. Looked at aright, Mr. Bennett thought this case should impress on the profession the importance of three things:—

(a) The danger of employing such a drill as is capable of putting a new channel for itself.

(b) The unwisdom, to use no stronger term, of too confidently expressing the opinion that we can cure a case that others have failed in, since some unlooked for obscurity may escape our observation, and

(c) The need of a little charity towards others who may have been unsuccessful in the treatment of cases.

Mr. J. ACKERY then contributed his casual communication. He said that in bringing forward the two or three cases to which he was about to call attention, he was afraid he was doing so without being able to give any very distinct record. The previous history had not been well known, but this fact in itself gave the greater scope for discussion as to the causes of the abnormalities. In the first instance, the model he wished to show was that of a lad aged fifteen or sixteen, in whom the right lower first molar had become impacted; it remaining on a lower level than the second molar. The

puzzle was how a six-year-old molar could become impacted in this way. In his experience it was unique. The tooth was carious at its posterior aspect and as the patient had not got his wisdom teeth Mr. Ackery thought it best to remove the misplaced tooth. This he did, and the wisdom tooth afterwards erupted occupying very nearly the position of the second molar. Another case quite inexplicable to his mind was one which occurred in a member of his own family. The second upper molar had never come down to its true level, the first molar was tilted forward. There had never been any irregularity of the lower teeth to account for the position of the upper.

The third case was that of a medical man, in whom the second upper bicuspid tooth on the left side pointed into the sulcus. As the tooth was carious Mr. Ackery advised removal and on this being done an unusual condition of the root was found to exist. The tooth was shown. The fourth model showed persistence of the upper temporary and permanent canine teeth on both sides, and abnormal position of both bicuspids on the left side.

Mr. DAVID HEPBURN being called upon by the President, said that he did not propose to occupy the time of the Society for more than a few moments, while he described his model of a new dental dressing stand. Very often in ordinary practice some contrivance suggested itself which proved to be a convenience, and which when used after a time became to a certain extent indispensable. The stand was designed so as to form a convenient receptacle for small quantities of drugs and dressing materials for daily use. It is provided with spirit lamp, &c., and is so arranged that its contents are contained within a small compass, and are capable of being manipulated with one hand by the operator. It consists of three tiers, reduced to the smallest possible dimensions consistent with utility, the whole revolving by a touch of the finger or dressing forceps on a foundation stand, by which arrangement the drugs and materials may immediately be brought within easy reach. The lowest tier is represented by a series of small boxes or receptacles containing coloured discs of bibulous paper, pink and white gutta percha pellets, amadou and also a rasp on which to strike matches. The second tier contains receptacles for, and is furnished with six small bottles of various colours, match-box, cotton wool holder, and gutta percha heater. The third tier is represented by the

ordinary spirit lamp. The system suggested for "dressing" is the employment of discs of bibulous paper of different colours associated with the various drugs employed. For example, *pink* is associated with carbolic acid, and further the carbolic acid is contained in a pink bottle. Arsenic is associated with *green*. Perchloride of mercury with *blue* and so on. As the covers of the bottles work on hinges and may be easily lifted with the dressing forceps, and moreover, are neckless there is convenient access to the drugs. The gutta percha or mastic covering of the dressing may be applied also with equal cleanliness, ease and expedition. The system of coloured bottles (which of course in addition should be labelled) enables the operator immediately to recognise the whereabouts of his favourite therapeutical agents, and by the use of the coloured discs to know the nature of the dressing employed even if removed after a lapse of time.

The PRESIDENT thought the apparatus an extremely ingenious arrangement and a great practical utility. The Society was much indebted to Mr. Hepburn for bringing it forward. He would now mention that Dr. Scanes Spicer had been good enough to bring two patients for them to see, and as it would be necessary to see them in a darkened room, perhaps it would be convenient to do so at the close of the meeting. Mr. Ashley Barrett had also brought a patient, showing a case of double dislocation of the jaw, and he would call upon Mr. Barrett for his communication in connection with it.

Mr. ASHLEY BARRETT said that the patient presented herself at the out-patient department of the London Hospital about three months ago, and complained of almost complete inability to open her jaws. There was considerable pain on the left side of the mouth in the neighbourhood of the wisdom teeth. Mr. Barrett opened the mouth under chloroform with a screw opener, finding it necessary to use only a moderate amount of force. He extracted the third molar. A certain amount of inflammation was going on round it, and in the neighbourhood of the masseter muscle. In January last the patient came again to Hospital, and said that every time she opened her mouth the jaw clicked, and on examination the condyles of the inferior maxilla apparently slid over the corresponding eminentia articularis, and when she closed her mouth again the dislocation on both sides was reduced. She said it all but entirely prevented her eating. There was a good deal of pain, and the clicking noise produced constant headache. The points

upon which Mr. Barrett said he should be glad to have the opinion of the members were, first as to the cause of the dislocation, and secondly what was the best mode of giving relief. With regard to the cause it seemed to him to be a somewhat obscure matter. On consideration he had thought three possible conditions might have caused it. The patient complained of clicking in every joint. The right shoulder joint was liable to be dislocated, also the left knee. It occurred to him that possibly she might be affected with rheumatoid arthritis, which sometimes affects the jaw ; there might be accompanied with this a growth of bone about the glenoid cavity which might be the cause of the pushing forward of the lower jaw. Mr Barrett was not quite clear in his own mind whether complete dislocation existed. The second suggestion was that possibly, though he was not conscious of it, he might in forcibly opening the mouth have stretched the capsular ligaments. The third possible cause was that the capsular ligaments might have wasted and become very lax ; the external pterogoids might also act in an inordinate manner, and they might draw the condyles forward. As to treatment, it occurred to him that this slipping of the jaw might be prevented by mechanical means, and for this purpose he had constructed a head-cap with bands which connected it to a chin-cap made of vulcanite, so that a constant traction might be exercised on the jaw, and he was hopeful that by continued action the condition might be improved. Further, he should mention that the patient had no front teeth, a circumstance which he proposed to utilise by making a strong metal plate with rather long upper incisors, which he hoped would prevent the jaw from sliding forward.

Mr. W. H. COFFIN, in discussing Mr. Storer Bennett's case, wished to say that about a year ago a lady came to him under almost similar conditions to those described by Mr. Bennett, the only difference being that the lateral incisor root carried a pivot and an Ash's tube tooth on a gold pin. Every effort to alleviate the discharge failed, and Mr. Coffin extracted the root with the pivot and found, as he suspected, that there had been a perforation in almost the same position as in Mr. Storer Bennett's case. The gold pivot protruded about the thirty-second of an inch. After removing the pivot and making the root smooth on the outside he replanted it, and it became perfectly firm. Mr. Coffin afterwards mounted a Logan

crown on it, and the case was doing perfectly well. He mentioned the case because it would encourage him in future to extract and replant a similar tooth.

Mr. F. J. BENNETT, commenting upon Mr. Barrett's case, said that it scarcely would appear to be a true case of dislocation of the lower jaw. It seemed to him to be more a gliding forward movement on the condyle, and was probably due to the relaxation of the ligaments, and increased by constant repetition. Probably, if such a splint as Mr. Barrett had suggested were rigorously applied for a few months it would restore the jaw to a proper movement. In such cases he believed the explanation was that the condyle was unusually shallow. In such circumstances it was not rare to find a little forward movement of the jaw, but not a true dislocation. With regard to Mr. Ackery's first case—from his description it reminded Mr. Bennett of a case he had seen in private practice. The first lower molar was impacted between the second molar and second bicuspid. The portion of tooth exposed above the gum was of such a curious shape that Mr. Bennett thought it was an odontome, but he found on extracting it that it was an ill-formed tooth, with a short conical fang. Mr. Bennett believed it had been pointed out by Tomes and others that the relative height and position a tooth assumes is largely due to the growth of the fang, and therefore he concluded, in his own case, in consequence of the fang being much dwarfed, it had been overtaken by the second molar and bicuspid, and once being behind in the race, had been held down in position by the other teeth.

Mr. F. NEWLAND-PEDLEY expressed his agreement with Mr. F. J. Bennett as to the nature of Mr. Barrett's case. He did not for a moment think it was a case of perfect dislocation. He had the pleasure to exhibit a model of the mouth of a man aged twenty-four, with inherited syphilis. When about six years of age he got necrosis in the palate and about four years afterwards he erupted a tooth.

Mr. W. H. COFFIN then exhibited a paper disc, with a peculiar central perforation, the invention of Dr. Kimball, of New York, consisting of a combined slit and hole, allowing the flat head of a screw-mandril to be passed through bodily, without the necessity of completely removing the screw from the mandril.

The PRESIDENT then called upon Dr. Collins for his paper. (See page 337).

DISCUSSION.

The PRESIDENT said with reference to the paper which Dr. Collins had just read, he was sure he was only expressing the unanimous feeling in thanking him for his extremely valuable contribution. If this iconoclastic paper had smashed their idols they must accept their fate and not so hastily jump at conclusions, which some appeared to have done, he (the President) amongst the number.

Mr. J. F. BENNETT said, with reference to the case alluded to by Dr. Collins, and which occurred whilst Mr. Bennett was a student at the Middlesex Hospital, that it caused a good deal of interest at the time, being supposed to be an example of reflex amaurosis of dental origin. The patient whilst having a lateral tooth pivoted, suffered pain and loss of vision in the corresponding eye. Mr. Coleman, who was the dental surgeon under whom she was admitted, and who described the case at the Odontological Society, was of opinion that the pivoted tooth was the cause of the amaurosis. The patient was also seen by Mr. Lawson at the Middlesex Hospital, and he held the view that the affection of vision was in no way of dental origin, but was simply due to iritis. As Mr. Lawson was the only ophthalmic surgeon consulted, Mr. Bennett had always felt it his duty to point out this fact whenever the case was described as an example of the connection between amaurosis and dental trouble.

Mr. ALBERT mentioned, as illustrating the difficulty of tracing the relation between cause and effect, the case of a little child of his acquaintance, aged about seven or ten, suffering from ulceration of the cornea. She was taken to one of the first oculists in London, and he treated her in the orthodox way. After three or four weeks, as the ulceration did not clear up, she consulted Mr. Power, who attributed the lesion to a temporary molar, this was extracted, and the ulceration disappeared.

Mr. C. S. TOMES wished to say one word about a case Dr. Collins had alluded to seen by Mr. Critchett—a case of repeated attacks of cellulitis and coincident peculiar condition of the mouth. It was a remarkable case; the patient was very bad indeed, and seemed almost to be dying. There never was any suppuration, only serum. The teeth were very stunted for a girl, and there were very few permanent teeth. Those that she had were very stunted, pointed peg-like sort of teeth with hardly any enamel, and they were erupted to a very

small extent only. But on no occasion upon which he saw the patient was there any inflammation about the necks of the teeth, though he did not see her quite in the first instance. Some of the teeth when they were removed were sound. The recurrence of the cellulitis and the dental peculiarities did not suggest cause and effect, but rather concomitant conditions. He could not in his own mind connect the condition as cause and effect, nor could he think of any case like it. But there they were, the very stunted teeth cut long after the normal period and at long intervals. It did occur that cellulitis was coincident with the cutting of the teeth. But there was no abscess nor any inflammatory condition.

Mr. W. A. HUNT remembered being present when Mr. Power read his most interesting paper. It was a paper which produced an impression of suspicion that there was a connection between conditions of the eye and the teeth. He thought Dr. Collins' sceptical paper would induce the dental profession to examine very carefully the evidence brought forward in support of any supposed connection between diseases of the eye and teeth. Dr. Collins' paper had been read in post-ophthalmoscopic, not pre-ophthalmoscopic times, and Mr. Hunt thought that there existed now more than ever a very strong suspicion of the connection between certain dental and ophthalmic conditions. They might not have all the evidence that Dr. Collins required, but, as he said eight years ago, he hoped that careful notes would be taken of any cases affording grounds for supporting a relation between the one and the other, so that the details might give something definite, and no mere hypothesis to work upon. He believed, and he was speaking from his own experience, that there was a connection between certain diseases of the eye and teeth. When surgeons were found removing one eye lest the other might be affected; when constitutional and local disturbances were shown to be related to each other, he could not help thinking that there might be a connection between functional disturbance of the eye and diseases of the teeth.

Mr. F. J. COLYER wished to mention a case of slight corneal ulcer, treated by Mr. Power, at the Westminster Ophthalmic Hospital, with success. In the temporary molar, there was a fig-pip which was pressing on the exposed nerve. On removal of the tooth the corneal lesion got well.

Mr. MORTON SMALE thought that dentists were a little inclined sometimes to jump at hasty conclusions, and that they

should therefore be very much indebted to Dr. Collins for breaking up some of their idols. After Mr. Power's paper, Mr. Smale began to think he had been very neglectful in failing to observe related conditions between the eye and teeth. Shortly after, a colleague at the Westminster Hospital sent him a case of glaucoma, in which there were some decayed stumps on the side of the glaucoma of which he thought they might probably be the cause. After Mr. Power's paper, Mr. Smale thought so too, and he accordingly removed the stumps. Things went on very nicely indeed for about a year, when he saw the patient again, and congratulated him on the cure of the glaucoma; he had hardly done so when the glaucoma recurred. This case had hardly left him when an almost similar case was sent him by a fellow student who thought the glaucoma might be due to the decayed teeth, but in spite of the removal of these teeth, and of putting the mouth in good order, the glaucoma continued, and the patient had to be operated upon.

Mr. PATERSON said Dr. Collins had alluded to conjunctivitis and lachrimation, but he had not supported his position by quoting any cases. Mr. Paterson desired therefore to supplement the paper. The first case he would mention was that of an upper canine which was carious and had been neglected; the pulp had died, and the stump only remained. Several abscesses had formed from time to time and sinuses were left on the gum. Lachrimation afterwards developed in the eye on the same side, but immediately disappeared on the extraction of the tooth. This, Mr. Paterson thought, was a case of connection between affection of the branches of the fifth nerve supplying the eye and teeth; and possibly might be accounted for by the spreading of inflammation along the sheaths of the nerves, with that proliferation and development of nuclei towards the surface, which was mentioned by Mr. Power in his paper read before the Odontological Society. Another case was that of two supernumerary teeth of bicuspid-like form, in position immediately in front of the two upper central incisors. Both teeth were carious and abscessed, with much inflammation of the surrounding tissues. Lachrimation of both eyes was present, and also several small phlyctenules on the corneæ. The removal of the teeth was attended immediately with the same satisfactory result. Mr. Paterson desired to point out that the ophthalmic surgeons ought not to blame the dental profession for any want of evidence. Oculists sent

cases to dentists for treatment, but after leaving the dentist and going back to the oculist, these cases if they got well, were never heard of again unless the dentist actively followed them up. He appealed to ophthalmic surgeons to report to dental surgeons the results of dental treatment upon their cases, and thereby afford better opportunities for studying the whole question of the connection of the diseases of the teeth with the eyes.

Dr. JOB W. COLLINS having briefly replied, Dr. Scanes Spicer demonstrated the electric illumination of the antrum.

Dr. Scanes Spicer's patients, referred to earlier in the report, were cases of antral disease, one patient being a male and the other a female. They were seen in a darkened room, a small incandescent electric bulb lamp being placed in the closed mouth, and the light from the lamp being projected upwards by means of a reflector under it. In each case there was a remarkable difference between the right and left side of the face as to the translucency in the antral regions. On the side where the infiltration or thickening existed there was no illumination, but on the healthy side the translucency was decided, particularly near the inner corner of the lower eyelid, which Dr. Spicer spoke of as a diagnostic point.

MANCHESTER ODONTOLOGICAL SOCIETY.

The usual monthly meeting of the Manchester Odontological Society, took place on Tuesday, March 3rd, at the Grand Hotel, Manchester. Mr. T. Murphy, *Vice-President*, in the chair.

CASUAL COMMUNICATIONS.

Mr. HOOTON showed two early patterns of mineral teeth. The older one he believed had been made by Delabarre, of Paris. They were very primitive, and the way the teeth were fastened to the gold plate was by means of a groove, which ran longitudinally at the back of the tooth, in the sides of which "tags" of platinum were embedded, the free ends of which were bent over and soldered to a gold pin, fitted to the groove. To make the thing more complete, a gold back was then soldered on.

Mr. SKIPP drew attention to the great increase in Rigg's disease, and said he should be glad of any information upon the subject.

Mr. G. G. CAMPION said he hoped that Mr. Hooton would present the teeth, which were very interesting to the museum. With regard to the suggestion made by Mr. Skipp, he thought it was a subject which deserved more attention than could be elicited by a mere casual communication. It was a subject of great interest, both scientific and practical, and he hoped that Mr. Skipp would read a paper on the subject at some future meeting.

Mr. WM. HEADRIDGE said that with regard to the teeth exhibited that evening as a specimen of ancient French dentistry he had some very similar which had been manufactured by Berends, of Manchester and Liverpool at least sixty years previously. If required for a pivot gold wire was fitted into the groove; the flat pieces of soft platina, embedded in the tooth, were then bent over the wire, other pieces of platina being fitted so as to cover the back of the root. These teeth were very useful and in some cases looked very natural, being in those days a great boon to the profession when they had nothing else but natural teeth, or those carved in ivory. When used on dentures they were difficult to repair, cracking to pieces when re-heated. His only object in mentioning these facts was to show that at an equally early period teeth of a similar kind were manufactured in this part of the country.

MR. HOOTON then read his paper on "Dental Therapeutics." (See page 348).

DISCUSSION.

MR. G. G. CAMPION said the paper was full of points of practical importance and one which they would all profit by. With regard, however, to the growth of their knowledge in regard to caries, the essayist alluded to Messrs. Underwood and Milles, and attributed to them as he (Mr. Campion) thought too much of the honour of the discovery of bacteria in carious dentine, for they were known to exist in carious dentine long before 1881. Leber and Rottenstein attributed to them an important part in the production of caries, and Magitot alluded to them in his work on caries some 15 years before that. But it was Messrs. Underwood and Mills who first attributed to them the primary rôle in the formation of caries, though the facts then known only enabled them to

advance an hypothesis as to their action. Magitot had produced artificial caries by subjecting teeth to the action of the fermentation of sugar but attributed the caries merely to acids, but Dr. Miller had made the circle of their knowledge complete by the production of artificial caries in culture tubes in his laboratory, in which the action was due entirely to acids formed by the germs. In his allusion to antiseptics, Mr Hooton said that he thought that perchloride of mercury was too powerful a drug to use in an antiseptic mouth wash. In one of his papers in an American journal, Dr. Miller had said that he did not think it was possible to make a thoroughly disinfectant mouth wash without the perchloride. He (Mr. Campion) had used it in a mouth wash without any evil results. Then with regard to stopping materials he was inclined to think that too much stress might be placed on the fact that copper amalgam was an antiseptic, occasionally he had noticed that decay had gone on beneath it, and although the cavity might appear quite sound, yet they found that the dentine underneath had been decalcified, and could be easily cut. In regard to its value at the cervical edge of the cavity, that in his opinion, was the weak point in the use of copper amalgam, as it often wasted away at that spot. Mr. Hooton had quoted Dr. Miller as to the value of applying antiseptics directly to an unhealthy pulp. He (Mr. Campion) had used the perchloride in one case not long ago which he found impossible to devitalize with arsenic. He applied a small quantity of the solid perchloride, covering it with a metal cap, and filling over that with copper amalgam. The tooth was a little sore to bite on, for a few days, but was now doing its duty without any discomfort to the patient. Touching the qualities of Iodoform he (Mr. Campion) should like to ask Mr. Hooton what was his authority for saying that it was an antiseptic in the case of *bacterium termo*, but not in regard to other forms of germs found in the mouth. He (Mr. Campion) had seen some of the culture plates on which Dr. Miller had tested the antiseptic properties of a variety of drugs. Iodoform tested in that way showed no antiseptic action whatever, yet Mr. Hooton said they might regard it as one of the most powerful antiseptics known to them in the treatment of necrosed teeth. He himself thought that the undoubted value of Iodoform was due, not so much to its antiseptic property, as to its action on the ptomaines which it destroyed or in some way rendered innocuous. He

had used iodoform, mixed with solid perchloride of mercury in the treatment of pulpless teeth, and had had great success with it. It might at first sight seem rash to use so poisonous a drug, but he would like them to remember that it might be given internally in larger quantities than arsenic, which they were in the habit of using in certain quantities without risk.

MR. COLLETT said he would like Mr. Hooton to explain what he meant by saying that nitrate of silver was a harmful drug, inasmuch as it only *stained* the tooth. He had had very good results in pulpless teeth through using iodoform, sometimes using it on cotton wool and sometimes combined with gutta-percha; and again in capping almost exposed nerves by incorporating it with one of the white fillings as fossiline. Like Mr. Hooton he had come to the conclusion that it was not the iron which did the harm, but the various acids used in dispensing the iron. *He* had also immersed a tooth in a tonic which had been prescribed by a medical man, and evidently there was a great excess of acid, as at the end of three days it showed unmistakeable signs of decalcification. He was glad to hear Mr. Hooton praise copper amalgam, and quite agreed with him, as it undoubtedly stood on the gum edge of teeth better than any material they possessed. Whether it was antiseptic or not he could not say.

MR. C. R. MORLEY objected to the use of Iodoform, on account of its very disagreeable smell and taste, but recommended a mixture of equal parts of guaiacol, and oil of cassia, which he found very satisfactory. He would like to know how it had been proved, that unannealed gold was antiseptic. He was inclined to think that copper amalgam possessed some antiseptic properties, and that when worked with care, and well mixed, it was one of the best amalgams at the cervical edge.

MR. SKIPP said Mr. Hooton had referred to the thorough cleansing of the teeth as one way of keeping the mouth antiseptic. A great deal, however, depended on the saliva. They would find that teeth in an unhealthy mouth decayed much more rapidly than in a healthy one. In some cases the saliva seemed to favour not only the formation of bacteria, but of acids. They must remember that the teeth were in a hot bath, and were only able to resist a certain amount of acid, and if that amount was exceeded from whatever cause decay set in. He did not think the putting of Sullivan dow,

the cervical edge could be attributed to Dr. Miller, as he, (Mr. Skipp) was taught the practice in London ten years ago. Sullivan did not stand at the cervical edge at places not exposed to friction.

Mr. RENSCHAW said he had always had excellent results by treating pulpless teeth with iodiform. He did not use it in the shape of a powder, nor as it was used at the hospitals. Used in the ordinary way the iodiform was apt to stick to the sides of the teeth, and they did not know whether it reached the apex of the root. It struck him that if he could incorporate the iodiform perfectly with glycerine, it could be syringed down to the apex of the root. He therefore placed a certain quantity of glycerine in a flask, with some iodiform, and then heated the flask to boiling point. He was very much surprised to find that the iodiform crystals were completely dissolved, and the solution was not only a good antiseptic, but also a powerful escharotic.

MR. SIMMS : Does the liquid retain the odour of the iodiform ?

Mr. RENSCHAW : No, the iodoform entirely disappears, and the liquid becomes a claret colour.

Mr. SIMMS said he himself thought that the usefulness of iodiform had been greatly over-rated. It was always a difficult matter in the treatment of teeth, when they used several substances, to prove which was the most useful. In filling teeth he thought they would find an advantage in using sulphate of copper in conjunction with one of the white fillings. He thought that antiseptic properties of copper amalgam were of great value in the treatment of carious teeth.

Mr. P. HEADRIDGE said that Mr. Hooton had told them a great deal about the influence of drugs on bacteria, but gave them no idea as to what caused the ailments of the mouth. He considered that inflammation of the gums was more injurious to the teeth than any other form of disease. He would like to know how they explained the fact that the six year old molar was so often decayed before it came through the gums. Was that due to bacteria ? He thought that it was due to inflammation, and the inflammation was due to the presence of tartar. If they removed the tartar they would find the "sponginess" and unhealthiness of the gums decrease.

Mr. W. HEADRIDGE said he could not understand why

unannealed gold should be better than annealed gold. Nor why copper amalgam should be better than others at the cervical edge. He would, however, watch these matters more carefully himself in the future. He did not like the present quick way of treating dead teeth, and for his part he liked to dress them with oil of tar, and give them plenty of time before filling them.

Mr. PLANCK said he did not think Mr. P. Headridge's remarks about decay were revelant to the subject of "Dental therapeutics." He said that they already owed a great deal to the efforts of the scientific men in their profession, and that in a few more years they would have more accurate knowledge as to the causes which led to decay of teeth, and that when they had that knowledge they would understand how to deal with those diseases.

The CHAIRMAN said that although Mr. G. Champion did not think there was any harm in using perchloride of mercury, yet seeing it was so powerful a drug, he himself, would be very chary indeed in recommending its use in a mouth wash: it was so readily absorbed, that even in minute doses ptyalism might ensue from its use. With regard to the Tincture of Muriate of Iron, he thought that drug was blamed for a great deal more than it ought to be, with regard to its action on the teeth, in his opinion, it was one of the best preparations they could use as a nerve tonic, and in cases of anemia. In his experience of copper amalgams, he had not found it so safe on the cervical margin as some gentlemen seemed to have done; this seemed to be its weak point, as he had always invariably found, after a lapse of a few years, where amalgam had come in close contact with dentine, the dentine had calcified considerably. He also thought Mr. Renshaw would find very little Iodoform in his glycerine solution, as there was scarcely any drugs in the market so easily split up, when heat was applied, as the preparations of Iodine. For some years he had had the care of about 160 children, located in a Home on the moors, in his neighbourhood, most of whom were London gutter children, and had almost invariably found that these street arabs had better teeth than the middle class children in that district. He attributed this in a great measure to the lime, contained in the London water, an ingredient which was wanting in the Manchester water.

Mr. HOOTON in replying said that Mr. Champion had misunderstood him in supposing that he underestimated the value

of the researches of Magitot, and of Leber and Rottenstein. All he pointed out was that credit must be given to Underwood & Milles, and to Miller for putting the germ theory of caries on a firmer basis. He was still of opinion that the perchloride of mercury was too dangerous a drug for ordinary use. Mr. Campion had said that they often found under an old Sullivan's stopping an area of softened denture, but let them take the general opinion of practitioners as to the durability of different stoppings, and they would find the feeling was that Sullivan's stopping in certain positions lasted as long, or longer, than any other. Mr. Campion thought that he (Mr. Hooton) was too dogmatic as to the use of Iodoform, but they must remember that it was used in almost all hospitals, both at home and abroad in the antiseptic treatment of wounds, and that even foul stinking ulcers yielded rapidly to its action; and they were therefore justified in setting a high value on it as an antiseptic. It was important to bear in mind the distinction between antiseptics and disinfectants. Iodoform was not a disinfectant, as proved by the fact that certain kinds of micrococci could grow in it; all that was claimed was that it arrested putrefaction. It was a conundrum to him why unannealed gold should possess antiseptic properties. The small amount of iron in one bottle of medicine might not be injurious, but he contended that if a patient continued taking it for months it would have an injurious effect on the teeth. He thought Mr. Renshaw had made a good point in recommending the use of a solution of iodoform to dress the roots of teeth with. Mr. Simms had obtained good results by using other drugs, but this did not affect the question of the value of Iodoform. In conclusion he would like to refer to a remark made by the chairman as to the propriety of prescribing for our patients who may need medical advice, and thought this was strongly to be deprecated. It was for our own interest that we should live on good terms with the medical profession, and this was not to be attained by going outside our own province.

After the usual vote of thanks the proceedings terminated.

TO KEEP RUBBER DAM FROM SLIPPING.—After the rubber is in place; and the teeth and rubber dried with napkin or bibulous paper, dust finely pulverized rosin on the teeth and rubber. This will generally keep the dam in place, without other aid.

S. G. Welch, Off. and Lab.

Dental News.

ROYAL COLLEGE OF SURGEONS IN IRELAND.—DENTAL EXAMINATION.—The following Gentlemen having passed the necessary examination have been admitted Licentiates in Dental Surgery of the College:—Mr. Robert Obediah Bunting (Southsea), and Joseph William Thacker (Dublin).

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.—In terms of the Bequest made to the Royal College of Physicians of Edinburgh by the late Dr. John Parkin, Fellow of the College, a Prize is hereby offered for the best Essay—"On the Curative Effects of Carbonic Acid Gas or other forms of Carbon in Cholera, the different forms of Fever, and other Diseases."

The Prize is of the value of One Hundred Pounds Sterling, and is open to all nations. Essays intended for Competition, must be written in the English language, to be received by the Secretary not later than 31st December, 1892. Each Essay must bear a motto, and be accompanied by a sealed envelope bearing the same motto outside and the Author's name inside. The successful Candidate must publish his essay at his own expense, and present a printed copy to the College within the space of three months after the adjudication of the Prize.

THE AMERICAN DENTAL SOCIETY OF EUROPE will hold its Seventeenth Annual Meeting at Heidelberg on the Neckar, in the beautifully situated Schloss Hotel, on August 3rd., 4th and 5th of this year.

The Officers for the year are : *President* : Dr. William R. Patton, Cologne. *Vice-President* : Dr. Isaac B. Davenport. Paris. *Treasurer* : Dr. Charles H. Adams, Frankfort, *Secretary* : Dr. Lyman C. Bryan, Basel.

Executive Committee : Drs. Patton, Adams and Wetzel.

Drs. Davenport, Jenkins and Prof. Miller.

MEMBERSHIP COMMITTEE:—Members of the profession are cordially invited, and are requested to notify the Secretary at an early date of their intention to attend the meeting,

contribute papers or demonstrate before the Society. Programmes will be issued by June 1st, and may be had on application. The charming site of Heidelberg will allow the Society to intersperse its three days proceedings with excursions to interesting points and visiting the University and the magnificent ruins of the castle.

A DISPUTE ABOUT ARTIFICIAL TEETH.

FLEMING V. BARFORD.—Mr. R. M. Fleming, dentist, George-street, sued Mr. F. Barford, plait merchant, of Milton-road, Harpenden, and William-street, Luton, to recover £4 4s. for professional services rendered and goods supplied. The defendant counter-claimed for £3 for an upper and lower set of teeth belonging to him and detained by the plaintiff since December last, and £2 for damages caused by the detention.—Mr. C. H. G. Knowles represented the plaintiff, and Mr. G. H. Brooke was for the defendant.

The plaintiff, who said he was a qualified practitioner, stated that the defendant came to him and showed him some old teeth. Witness could do nothing with these, and defendant then said witness had better make him a new set. Witness extracted a tooth, and after that the old set would not stay in. First of all defendant asked what it would cost to make a new set, and witness replied £7 10s. Defendant said he would not pay that; he would not pay more than £4, for which sum he said he could get it done elsewhere. Witness said he could not make a new set for that price unless he had given the old ones. Defendant agreed, and witness took them with him, and took a "bite" from the old ones according to the usual practice. An agreement was drawn up in which witness engaged for the sum stated to supply the defendant with a set of teeth with which he "could be comfortable and eat well." When the teeth were prepared he took them down to defendant at his warehouse and fitted them in, cautioning him to be careful and not take them out as there was very little suction in the mouth, he being an elderly man. There were a lot of stumps which really ought to have come out, but he would not allow witness to take them out. Defendant brought the teeth back next day saying they were no earthly use to him. Witness offered to make any alteration that might be required, and took them to the defendant's place on the following day. He said they seemed

a little better and that he would try to get on with them, and witness left him smoking his pipe with the teeth in his mouth. But the very next day he sent them back, stating that they were no use to him. Thinking there might be something wrong with them, witness put in an extra suction cavity.

The teeth were here handed up to the Judge, along with the models, and plaintiff pointed out and explained to his Honour what he meant.

After this additional suction cavity had been put in witness sent the teeth back to the defendant by his brother, with instructions to him to try to keep them in his mouth. The defendant came into his surgery shortly afterwards in a terrible rage and used some very expressive language, asking witness what he meant by not providing him with a proper set of teeth, and calling witness by very bad names—in fact, said witness, words that I would not care to use in the court. He said the teeth were no use to him, that he would not have them, and that he was sorry he did not go to another dentist. He also demanded his old teeth back again. In fact he made quite a scene, taking his coat off and wanting to fight witness.

After further evidence the Judge remarked that this was one of those cases he could not decide, and he proposed to refer it to some professional man to see whether the teeth were perfectly made or not.

Mr. Brooke:—But I contend that the plaintiff has no right to bring an action. The contract, he maintained was that the teeth should be to the satisfaction of the purchaser.

The Judge said, however, it had been held that it must be regarded as reasonable satisfaction.

It was then agreed to hear what the two London dentists had to say on the matter. A glass of water having been fetched, the defendant was requested to dip the teeth in it. He then placed them in his mouth, and the witnesses closely inspected them, and declared them to fit perfectly well. They said the teeth could not be expected to fit comfortably at first, but they believed that if the defendant kept them in his mouth for two or three weeks they would do all right.

Some further discussion took place, but in the result his Honour, after some hesitation, said he must have regard to the evidence of the professional men, and gave judgment for the plaintiff.

APPOINTMENT

W. T. Pellow, L. D. S. I. has been appointed Dental Surgeon to the Royal South Hants Infirmary.

VACANCY.

Liverpool Dental Hospital. The post of House Surgeon is vacant. Applications to be forwarded to the Dean, 10 Oxford Street, Liverpool.

National Dental Hospital, 149 Great Portland Street, W.—The Post of House Surgeon is vacant ; Candidates must possess the L.D.S. Diploma. Applications with testimonials to the Secretary.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

PAINLESS ELECTRO DENTISTRY.

To the "Editor of the British Journal of Dental Science."

DEAR SIR.—As I see this method of extraction is being brought to the front again in London, will you allow me to give the results of the experiments that were conducted by an eminent dentist in our town, C. Spence Bate, F.R.S., using my apparatus, which is all contained in a small mahogany box, about 6 inches cubic, weighing only $6\frac{1}{2}$ lbs.

He says the first tooth taken out was one of my own, a left under third molar. It is not long since that I had the corresponding one on the right side extracted without any anæsthetic agent at all. The memory of the sharp pang of its removal is still undiminished. I therefore feel capable of judging the amount of relief that the electricity can afford. Before extracting the tooth several experiments were tried as to the amount of electricity that can be borne in the mouth. The instrument was placed upon the tooth, and again removed. And when it was extracted, I was not conscious of more sensation than at one of the previous experiments, and I did not know that it was taken out. The next patient was a lady about 43 years of age, weak and delicate from recent mental trouble. The tooth was removed without pain.

The next was a lady, aged 22, strong and healthy, the tooth removed was a second upper molar, she said that it was hardly any pain.

A lad about 13, said there was no pain at all. There was an abscess at the root of one of the fangs.

This was followed by a gentleman about 50 years of age. I extracted from him an under incisor, and then a second. He not only said that there was no pain, but that the sensation was like pulling something out of leather.

I have since operated on others with similar results, but I take the first cases as they came, and from these I think we can draw the following conclusions. 1st.,—That electricity in certain cases precludes the pain of extraction. 2nd., That different amounts of electricity are required for different teeth and different people.

I think sir, from the above we may look to electricity as a useful anæsthetic which may be used on patients affected with heart disease, and which does not leave any of the unpleasant feelings attendant upon the use of Methylene or Chloroform.

Yours obediently

WILLIAM HERDER, Ph.D., F.S.A.

Medical Electrician, 23, Athencæum Street, Plymouth.

To the Editor of the "British Journal of Dental Science."

SIR—My attention has been drawn to the letter signed H.C.C., in your Journal of the 1st. inst. The recently adopted practice of the London Dental Hospital has, to my knowledge, been in existence many years at other Hospitals, if not precisely under the same system, yet in a manner equally detrimental to the interests of our honest but struggling neighbours in the profession. The following case is an example. A poor patient applied in the usual way to have a tooth stopped. The gentleman by whom she was attended advised her to have an artificial denture, and for that purpose kindly gave her a letter of introduction to one of the officers of the Charity, whose terms were considerably less liberal than those quoted upon the Price List of the London Dental Hospital, she having paid this good Samaritan, according to her own statement, between £8 and £10. It is to be hoped that patients partaking of the "Charity" of the London Dental will fare more advantageously than the one to which I allude, not only in respect to charge, but also to treatment, both of which were in this case most unsatisfactory, so much so that I charged less than half the amount previously paid, and while benefitting the patient greatly by my treatment, was also able under the circumstances to compensate myself for my time and trouble, without incurring the suspicion of exorbitancy under the guise of charity. If called upon to do so, I shall be most happy to verify in detail the above statement.

I am, sir,

Yours faithfully,

M.R.C.S., L.D.S., Eng.

British Journal of Dental Science.

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THE MORE COMMON DISEASES OF THE TEETH.*

By Mr. E. C. MASTERS.

MR. PRESIDENT AND GENTLEMEN.—I have chosen the above subject, for my paper this evening, not with the idea of introducing anything new to your notice, but with the hope of recuscitating knowledge that may be lying dormant in some of our brains." We are all aware how essential it is to revive our store of knowledge not merely once in our lifetime, but many times, in fact the oftener we go over a subject the less likely are we to forget it. The diseases of the teeth being so numerous and extensive, I shall only have time to touch upon a very small number of them. I do not propose to enter into details of the prevention, and treatment of the various diseases, as this would involve too much of your valuable time.

CARIES.

As the disease, that is of the most importance, and interest to us, I shall first deal with "Caries of the teeth—its cause and varieties. Our interest in the disease is more enhanced by the fact that the disease is greatly on the increase amongst civilized communities.

There is no disease to which the teeth are liable, more frequent in its occurrence, and more fatal in its results than caries. Dental caries is a chemical decomposition of the earthy constituents of any portion of the tooth, accompanied by a partial or complete disorganisation of the animal framework of the affected part. The occurrence of the disease is

* Read before the Students' Society, National Dental Hospital, London.

usually first indicated by a dark or opaque spot on the enamel, and if the enamel be removed, the subjacent dentine will be seen to have become darkened in appearance, and as a rule the lighter the colour of the decayed dentine, the more rapid the progress of the disease, and *vice versa*. It generally begins at some weak part of the enamel, which it soon undermines, and proceeds towards the centre of the tooth, until the pulp is reached. When the diseased dentine has become sufficiently disintegrated the enamel walls break down, disclosing the havoc that has been wrought in the subjacent dentine. This is often the first intimation that the patient receives, of what has been going on.

There is no part of the crown, or neck of the tooth, exempt from the disease, though some parts are more readily attacked than others, such as the depressions on the masticating surfaces of molars, and pre-molars, the approximal surfaces of all teeth, and in short at any point where there is an imperfection in the enamel, the disease may develop itself.

There are several varieties of the disease. We have the calcareous, which is characterized by a white opaque spot on the enamel, and renders it chalky and brittle. The perforating variety which attacks the crowns of molars at a number of points simultaneously causing a speedy destruction of the tooth. Another variety M. Duval specializes as being confined to patients of a consumptive nature. The colour in these individuals being of a brownish white. It attacks the front teeth near the neck, extending downwards towards their roots, and forming a semicircular groove. Another variety is that known as arrested caries, which usually takes place on the masticating surfaces of molars, leaving a hard, smooth, polished surface of a dark brown colour. The roots of the teeth frequently remain firm in their sockets for years after their crowns have been destroyed, showing that they are less liable to decay than the crowns.

The causes of the disease are chemical agents, such as vitiated saliva, the putrifaction of particles of food lodged between the teeth, or in their interstices, the bad state of general health. It is a well known fact that the secretions of the mouth, especially the mucous, when in a vitiated condition, are capable of decomposing the enamel of teeth not possessed of more than ordinary density. The truth of this assertion is demonstrated by the fact, that dead teeth and the crowns of animals teeth, when used as a substitute for the loss

of the natural organs, are as liable to decay as living teeth. Artificial teeth manufactured from bone or ivory are affected in a similar manner. If the disease was solely dependent upon a vital operation, neither dead teeth, nor dental substitutes formed of bone or ivory would ever decay, but inasmuch as they do it is reasonable to surmise that the cause which produces it in the one case produces it in the other. Among the direct causes of caries are, crowding of the teeth, (so causing the enamel to "star" or crack and thus giving access to the free acids of the mouth) the wire of artificial dentures, and many more causes too numerous to mention. For treatment we resort to that now generally adopted by the removal of the decomposed matter and filling the cavity with an indestructible material.

EROSION.

Another affection to which the teeth are liable is characterized by the gradual decomposition, first of the enamel, and then the subjacent dentine, around the necks of teeth, giving them the appearance of that portion of the tooth being cut with a file and highly polished, and to which the term "erosion" has been applied. The exposed dentine is usually very sensitive to touch, and impressions of heat and cold. It is most commonly seen on the labial aspect of the incisors and bicusps, and is more common in the upper than lower jaw. Erosion must not be confounded with ordinary caries, which is a most common error to make. Where erosion has taken place, the diseased part is hard and polished, and of a yellowish colour, whereas caries is of a soft nature and of a brownish colour. The cause of the disease is obscure. It is attributed by some authorities to the solvent action of the acidulated condition of the mucuous fluids of the mouth on the enamel. It is not caused by mechanical friction. The disease is treated in the same manner as ordinary caries.

ABRASION.

When, for example, on the loss of the posterior teeth the upper and lower incisors strike upon one another, the cutting edges are subjected to an abnormal amount of friction, which slowly but surely wears away the crowns of the teeth, and would in due course of time expose the pulp. Nature here comes to the rescue by gradually obliterating the pulp and

converting it into secondary dentine. By this wise provision of nature, the painful consequences are prevented, and little inconvenience is experienced, at least not until the crowns of the teeth are worn down to the level of the gums, which is a somewhat rare occurrence. It is advisable to file down any sharp edges that may develop themselves, and polish the part with a slip of Arkansas, or other suitable stone.

HONEYCOMBED TEETH.

A defective condition of the structure of the teeth usually known as honeycombed teeth, will now claim our attention. It is an affection characterized either by perforations in, or discoloured spots on the enamel of two, four, or more teeth in each jaw. It is characterized by irregular depressions or holes in the enamel extending transversely across and around the tooth. These pits are sometimes separated from each other, or they may be confluent, forming an irregular horizontal groove. Sometimes they penetrate but a short distance into the enamel, at other times they extend entirely through it, the surface of the walls presenting an irregular, but usually glossy and polished appearance. Teeth are sometimes marked with two or three rows of these pits, two or more corresponding teeth in each jaw are always affected. This condition most likely results from constitutional disorders, whereby the secretions of the inorganic constituents of the enamel, being interrupted for a short time, the enamel cells are not filled up and consequently wither and perish, hence the pits. But as soon as the disease has run its course the secretion for the earthy matter for the cells and fibres of the enamel is resumed, and the other parts of the enamel will be well formed.

NECROSIS OF TEETH.

By this term is meant the entire death of one or more of these organs, that is death of the cementum as well as of the pulp. When a tooth is affected with necrosis it is soon thrown off by nature, by a process of inflammation and supuration. Occasionally a portion of the cementum may retain a sufficient amount of life to enable the tooth to remain for years in the jaw without producing much inconvenience. But if a dead tooth is found to be productive of injury to the

surrounding tissue, no matter how valuable the tooth may be, the health and durability of the other teeth should not be jeopardized by its retention.

EXOSTOSIS.

A disease we very often meet with is exostosis. The only part of a tooth affected by exostosis is the cementum, and it generally commences at the extremity of the root, extending from thence upwards. The bony matter thus deposited is of a similar structure to the cementum. Although sound as well as carious teeth are liable to the disease of exostosis, the occurrence of the affection is evidently the result of increased action of the vessels of the periosteum. As the affected root increases in size, the alveolus enlarges, so that the pressure of the former upon the latter is rarely very great, hence the deposition often goes on for years, without causing pain. At other times it causes the tooth to ache, and become extremely sore to touch. The disease does not admit of cure and having proceeded so far as to be productive of pain, extraction must be resorted to.

ALVEOLAR ABSCESS.

An alveolar abscess is a collection of pus in a sac formed in the socket of a tooth at the extremity of the root which generally escapes through the gums. The popular designation of the affection is *gum-boil*, a name that by no means conveys a correct idea of its true character, inasmuch as the gums are only secondarily affected, while the seat of the disease is always within the alveoli.

Its effects are always exceedingly pernicious, not only to the socket in which it is seated and the gums covering it, but very often to the general health of the patient. Whenever severe inflammation of the periosteum of the root of the tooth is excited, an effusion of lymph takes place, which hardening, attaches itself to the root around the apex, and is converted into a sac, which hollows out a little cavity for itself in the bone. Pus is formed in the centre of the sac and bathes the end of the root. The development is generally accompanied by a deep seated throbbing pain, and swelling of the face. As suppuration takes place the sac distends against the surrounding wall of the alveolus, burrowing its

way until it bursts either at the edge of the gum, or through the gum corresponding to the end of the root, or into the antrum when the fangs of teeth penetrate into it. When such is the case and pus cannot escape, the cheek and roof of the mouth are often distended. The formation of an abscess at the root of a lower wisdom induces inflammation and rigidity of the muscles of the jaw, making it difficult, if not impossible for the patient to open the mouth.

POLYPUS.

The pulp of a tooth when exposed by decay, sometimes becomes the seat of a fungous growth, constituting a small vascular tumour, designated "Polypus of the Pulp." These morbid growths sometimes attain the size of a large pea, completely filling up the cavity made in the crown by decay, at other times they do not exceed the size of "buck shot." The large sized polypi, have little sensibility and bleed freely from the slightest injury, the smaller sized ones are less vascular, but are nearly as sensitive as the pulp in a healthy state. There are two remedies open, either the removal of the tooth or the removal of the growth and subsequently the pulp; to be followed by the filling of the tooth. It often happens that a fungous growth of the gum finding its way through an opening in the side of the neck of a decayed tooth appears in the centre of the cavity, and this is often mistaken for a polypus of the pulp. These kind of tumours are not very sensitive and bleed readily on irritation. The treatment is to cut them off with a lancet a little below the level of the gum and fill the tooth.

CURIOUS CUSTOMS.

Apart from the importance attached to the teeth, some very curious and singular customs connected with these organs are observed among many nations of the earth.

The Brahmins of Hindostan rub their teeth for more than an hour with a twig from a species of fig tree, immediately after rising every morning addressing their prayers at the same time to the sun, invoking blessings on themselves and families. The inhabitants of Tonquin and Siam paint their teeth black, as do also the unmarried ladies of Java. Many of the woman of Sumatra have their teeth filed off to the gums ; others have them filed to points or the enamel filed off

in order to stain them black, which is considered to be extremely ornamental. The natives of distinguished rank in the islands, colour their upper teeth black and incase their lower ones in gold, creating a contrast which is regarded as particularly beautiful by candle-light. The inhabitants of some of the other East Indian islands consider it the height of the fashion to gild their two front teeth, and paint the remainder black. In many parts of India it is a common sight to see young ladies with diamonds, mounted and set in their upper centrals. The natives of the Sandwich Islands in order to appease one of their gods, offer up to him their front tooth. Apart from the peculiar and grotesque customs just mentioned, I think it would be well if English people generally, attached the same importance to the teeth as regards cleanliness, as do our friends in India.

EXTRACTIONS AND THEIR DANGERS.*

By Mr. F. R. GUYLER.

THE subject for our consideration and discussion this evening, is one, the importance of which, can hardly be overestimated in its relation, not only to the rapidly increasing number, who from time to time seek our interference with the extraction of their teeth, but to ourselves also, in practice, as dental-surgeons. There are few operations in surgery, which excite stronger feelings of dread, than the extraction of a tooth. Many persons endure the torture of toothache, for weeks, rather than undergo the operation of extraction, and, indeed, one cannot be surprised, when we are constantly hearing of so many accidents, which we cannot but attribute to unscientific operators; but when performed by skilful hands, as well as with the advantage of suitable instruments, the operation is always safe, and in the majority of cases may be manipulated with comparative ease. Dr. Fitch relates a case which will serve for illustration of above. The subject, in having the second right upper molar extracted by a blacksmith, had a large portion of jaw, and five other teeth removed at the same time. He goes on to say, that the roots of this tooth were greatly bifurcated, and dovetailed into the jaw, and would not pass perpendicularly out, though a slight

* Read before the Student's Society, Liverpool Dental Hospital, Liverpool.

lateral movement, would have removed it instantly. The jaw proved too weak to support the monstrous pull upon it, and gave way between the second and first molars, bringing part of the antrum. The broken portion extended to the spongy bones of the nose, and terminated at the lower edge of the socket of left front incisor, containing six sound teeth in all, viz., 1st molar, 1st and 2nd bicuspid, canine, and incisors of right side (six in all). The soft parts were cut away and a severe hæmorrhage ensued, and also left a very excessive deformity of the face. This only indicates the impropriety, and danger of entrusting such operations to unskilful individuals.

I do not hesitate, therefore, to bring this subject before you, not that I can bring new methods of treatment such as are brought before you by men of large experience and long practice, but merely wish that in the discussion which may follow, we may all receive hints, which it is possible we may have overlooked. Time would not permit in this small paper, to enumerate all the dangers of extractions, with their relative treatment, so that I wish, after giving a general idea of the methods of extraction, to consider a few of the most important ones.

Tomes says :—In extracting a tooth the following instructions should be fulfilled. 1st, the whole of the offending organ should be removed. 2nd, It should be removed with as little injury as possible to the structures to which it is implanted, and last, but not least, the patient should be spared all unnecessary pain in the operation. This last idea of Tomes, I think, is one of the most essential in private practice, for if we are able to accomplish this in student life, depend upon it, we have found the best method of extracting teeth.

I have divided my paper into two parts, viz., Extractions which are necessary; and, The possible dangers of such extractions. I think we are all familiar with the methods of extracting teeth, but as I said before, my paper is not merely to point out a few of the most uncommon dangers, but to impress more deeply upon your memories, the methods which we already know. As teeth are of various forms, have single or many roots, and are articulated in many ways with the jaw, the kind of operation necessary for the removal of one would not be applicable to another; therefore, there are several distinct operations as well as different

instruments. For instance, we should not think of extracting an upper incisor or lower bicuspid, in the same manner that we should extract an upper molar or a lower molar. Therefore, I do not think it will be detrimental to any of us to discuss these different modes of extraction, so that I purpose, first, taking the teeth of the upper jaw, and secondly, those of the lower jaw.

Again quoting Tomes, he says:—That in all cases where the forceps are used, it is necessary, first, to seize the tooth; second, destruction of its membranous socket; third, removal of the tooth from the socket.

For sake of convenience it will be advisable to divide both upper and lower jaws into four groups, viz., incisors and canines, bicuspid, molars, and wisdom molars. The incisors and canines of the upper jaw require a straight pair of forceps, and on account of their being inserted into the alveoli perpendicularly, and having their fangs formed very similarly to each other, render them capable of extraction by the same class of instrument. Being attached very firmly in their sockets, they cannot be extracted by a straight pull downwards, but require to be slightly rotated, (particularly canines on account of their conically shaped roots), taken gently forwards, and lastly straight downwards, so that it will be seen, that we have here three distinct movements for the removal of these teeth. The four bicuspid of the upper jaw require a pair of instruments with a slight bend in the handle; these, after forming up the blades, must have mainly an outward movement; although a slight inward movement may sometimes be made, then a steady pull downwards. These teeth must on no account be rotated as, at their roots, they are much flatter laterally, than incisors, and very often have two roots, so that there would be a considerable resistance between the process and the roots, which would most likely end in the retention of a part, if not the whole of the offending root; but we know that, in the case of extraction “The whole is better than a part.”

The four anterior molars of the upper jaw, are the largest of the teeth, and have, as you have already seen, three roots, two of which are situated externally and are called anterior and posterior buccal roots from their relative positions, and one internally called palatine, from its being situated near the palate.

The instruments required for the extraction of these teeth

must be made to embrace each root, the outer blade having two grooves, (the anterior being the larger of the two) for the embracement of the external roots, the inner blade having but one for the palatine. The palatine root, which is not only the largest, but also the longest, diverges from the two external roots, and passes upwards and inwards, toward the internal wall of the antrum, and is enclosed in tolerably dense bone. The external alveoli are composed of thin and porous bone. It will then be seen that the direction of force, must be mainly an outward one, and, on account of the palatine root, taking an inward course, it will be found to be in its own axis. A slight inward movement should be made previous to this, to disengage the fangs from the external alveoli, but precautions must be taken, however, that it should be no more than perceptible, for the nature of the parts as they are inserted into the alveoli, prevent its being taken too far, and perseverance in this direction, would certainly prove disastrous. These, with a downward movement, would complete the extraction of molars. It will then be noticed that three distinct movements are required for the extraction of upper molars; 1st slightly inwards, 2nd outwards; and lastly, downwards. If a first molar has been isolated by the second, and also by 2nd bicuspid, their vacated alveoli has been replaced by solid bone, and the tooth will generally be found to offer great resistance. In fact this applies to any tooth which has been isolated by its immediate neighbours, that extra precautions should be maintained, lest it should break. The third or wisdom molars require a pair of forceps, very similar in form to the ones required for the extraction of anterior molars, but should be bent in the handles like the bicuspid forceps. These teeth occasionally have three roots, but are more often found to be welded together to form one conically shaped root, and are for the most part very easily removed. The mode of extracting these teeth may be manipulated according to the direction of their insertion, which will be found to present exceptional characters. After the beaks of the instrument have been placed high up over the fang, and the tooth will not yield, then take it inwards, outwards, or forwards, as the case may be.

We will now consider the teeth of the lower jaw in the same order. The incisors and canines of the lower jaw, are smaller than those of the upper, but rather more compressed laterally at their roots. The instruments required for the

extraction of these teeth should have straight jaws, and unless the operator is used to the "Hawkbill" pattern it would be found convenient to have a slight bend in the handle to escape the upper teeth. After thrusting the blades well over the fang, an outward movement should be made principally, then straight upwards, (often combining the two together). Here we have but two movements for the removal of these, one less than for upper incisors.

The bicuspid of the lower jaw require a pair of instruments with the handles set at right-angles to the beaks. The roots of these teeth are more conically shaped than those of the upper jaw, so will permit of slight rotation, and this with an outward and upward movement combined, will complete the extraction of lower Bicuspid. The anterior molars of the lower jaw, are as a rule, set very firmly, and often require considerable force for their removal. The instruments used should have blades, each favoured with a slight projection, to go between the two roots. The blades of the instrument must be placed lightly on the tooth, and then pressed well down over the neck, the pointed eminence coming between the two fangs. The movement is chiefly an outward one, and combined with an upward force will complete the extraction of lower molars. The two posterior or wisdom molars of the lower jaw, have generally a single root only, which is of conical form, and often much curved, especially backwards, but like their corresponding uppers are inserted in various positions. The forceps, should have somewhat spear-shaped beaks, and curved at a moderate angle. The force required for the removal of these teeth is not very great, as the tooth often slips up between the blades of the forceps with a little pressure. If after a firm pressure downwards has been applied, and does not suffice, then direct the movement the same way as the insertion of the fangs. But if the elevator is preferred it must be found down between the alveolus, and side of the tooth, using the alveolus as the fulcrum, the tooth will usually be effectually removed. After applying the forceps to lower bicuspid, and molars, it will be found convenient to place the thumb of the left hand, over the joint of the instrument, whilst the fingers press the jaw upwards from beneath. In this way the forcep is guided in the desired direction, and the instrument prevented from coming into violent collision with the teeth of the upper jaw, at the moment when the tooth leaves the socket.

Extraction of roots which are not far broken down, present no greater difficulties than the extraction of the whole tooth, and indeed it is the root which is grasped in extracting a whole tooth ; therefore, the extraction of roots should be carried out, on the same principles which I have already described. As the root yields, so the blades of the instrument should be pressed further over it, to ensure safety. The roots of upper molars are more or less conically shaped and may be rotated, and if desirable when the pulp is dead may be separated by a spear-shaped instrument. This will be found convenient in cases where the external margin is smashed or decayed, the central portion remaining solid. Roots of lower molars are more flattened laterally than those of uppers, so require a rocking movement from within outwards.

It may here be mentioned that in extracting roots of any class of teeth, which can be removed by no other means than by taking part of the edge of the alveolus in the forceps, there need be no hesitation in doing so. Much may be said about the use of the elevator in extracting roots which I have not sufficient time to relate. In all cases where the forceps are used, the teeth should be grasped lightly ; then pressed upwards or downwards, as the case may be ; and, when the tooth is felt to yield, to press harder so as to obtain a firm grip over the fangs.

In reference to the above methods of extraction, it may be well to mention a few of the preliminary necessities for easy operating.

Before commencing, a careful examination should be made with mirror and probe, to ascertain whether the tooth, indicated by the patient, is the real seat of pain. Having found this out the chair should be placed in position, and in an operation on the upper jaw, the head should be about as high as the surgeon's breast ; but if in the lower jaw, the chair should be almost upright, and the patient's head about on a level with the surgeon's hip. The instruments required, should be placed within reach of the Surgeon, it always being advisable, to have the root forceps near in case of accident, as delay in this course, if an anæsthetic case, may allow anæsthesia to pass off before anything is done. The operator must have the jaw perfectly under his control, and almost a fixture for the time being, as patients in the case of upper teeth, tend to push their head upwards and backwards, and, in lowers, downwards and forwards. This can be overcome in many ways by placing the fingers

in different positions in the mouth, which I will leave to the discretion of each individual operator. As to the standing position I need say nothing, seeing there is a diversity of opinion, but for my own part, I have tried to avoid crossing from one side of the patient to the other, which is a great inconvenience, especially in anæsthetic cases, both to operator and anæsthesist.

I said that I would divide my paper into two parts, viz., Extractions which were necessary ; and the possible dangers of these extractions. I will briefly mention a few of the indications which determine the propriety of extractions, and which render the operation necessary, beginning with temporary teeth. I think it is necessary to extract all such teeth, when the permanent ones emerge from the gums, and have actually made their appearance ; and, also, when the aperture is so small as not to admit of the permanent tooth acquiring its proper position, then it may be necessary to extract the adjoining temporary tooth. Other signs for necessary extraction of temporary teeth is alveolar abscess ; pain which cannot be subdued by ordinary treatment ; and necrosis of the walls of the alveolus.

Permanent teeth under the heading of necessary extractions, have many indications, the most important being the following :—

Firstly.—When a tooth has been partially displaced from the loss of its antagonising tooth, and is a source of irritation to its surrounding parts, this should determine it necessary for extraction.

Secondly.—Irregularity in the arrangement of teeth, caused by the proportion of the size of the teeth and jaw not being equal ; gives reason for extractions ; but which, I will leave the gentleman to enumerate, who is to read a paper, upon “ Regulations.”

Thirdly.—Irritation of the surrounding parts caused by dead roots or teeth.

Fourthly.—Teeth which have become loosened from the destruction of their membranous socket, as in the case of “ Rigg’s Disease.”

Fifthly.—A constant discharge of foetid matter from the pulp through the carious opening, when very great and impossible to be arrested ; all such teeth should be removed.

Sixthly.—A tooth which is the cause of an incurable alveolar abscess, should not be permitted to remain.

Considerable amount of judicious care should be exercised in the case of incisors, that they should not be sacrificed, unless for some urgent necessity, neither should they be permitted to remain in the mouth, if it creates a morbid action upon the surrounding parts, for the retention of such may be worse than the loss of the tooth.

I will now take a few of the most common dangers in extracting teeth, beginning with "Hæmorrhage." Bell says a very severe, and dangerous hæmorrhage, occasionally follows the extraction of a tooth, and has been known in some instances to terminate fatally. Hæmorrhage exists in two forms, viz., primary and secondary. Primary, is that stage which immediately follows the extraction of a tooth. Secondary, is that stage which occurs after the arrest of primary. A patient may have a tooth extracted, and hæmorrhage cease at the usual time, but may start a day, or even two days afterwards, a case like this would class with secondary hæmorrhage." In private practice, the surgeon when treating a case of hæmorrhage, should be extremely careful, in extracting teeth for members of the same family, seeing that this weakness is usually hereditary. There are many styptics for local application, which are not necessary to run over, the principal being; tannic acid; nitrate of silver, and perchloride of iron. There are, also, many simple local remedies, such as composition, lint, compressed sponge and wax; all of which, must be thoroughly compressed. The coagulum in the bleeding, should, first of all be arrested, and then any of the above packed in each root socket, and consolidated by each portion pressed upon the next, above it. The mouth should then be forcibly closed, so as to retain the plug Rubber plates are sometimes used, and Tomes seems to be fond of matics leaf rolled into pellets and packed in. Any of these remedies may be used at the discretion of the operator. I shall not have sufficient time to give details of the other important dangers, so shall have to be content with just mentioning them.

The chief are:—Fracturing of the tooth; breaking the tooth and tearing the gums; forcing a root into the antrum; in anæsthetic cases, especially of the extracted tooth, slipping from the beaks of the forceps, falling into the pharynx and being swallowed; extracted teeth falling into air passages; dislocation of lower jaw; and also a slight danger of letting the beaks of the forcep slip, and taking out the wrong tooth,

which shows the importance of being able to see what you are doing. Time will not permit of my mentioning the different cautions, how these dangers may be avoided, which would require an evening to itself.

RETAINING POINTS.

E. ERNEST MURRAY.

I will be glad when dentists learn to start gold fillings without retaining pits, they are so fatal to the pulps of teeth. I repeatedly find teeth, laterals especially, where pits have been made to retain gold fillings, with the tooth dead and discoloured, and, perhaps, abscessed.

Now a few words as to how I fill a tooth with gold. In all cases I first adjust the rubber-dam (when I see a man that don't, I think to myself, he is not skilful enough in applying the dam, that is the reason), then I cut the margins down with my enamel chisel as smooth as possible, and avoid sharp angles. Then with a spoon excavator I take all soft decay from the bottom of the cavity, if I can, without coming too near in contact with the pulp; if I can't, I leave it in. I cut slight undercuts everywhere I can get them without weakening the tooth, at least in two places opposite each other, and all around, if possible. Then I pack non-cohesive gold all around the margins, in the old-fashioned way, till it is flush with the edge of the cavity, then build out the cuspid with cohesive gold, thoroughly condensed with the mallet, so it will take a high polish. I always start with non-cohesive gold for three reasons: first, it forms a more perfect adaptation to the wall of the cavity; second, because I can put in a gold filling better in about half the time; and third, because it does away with retaining points. Especially the first, because in the margins lie the virtue of your filling; however artistic it may appear, if it is not air and water-tight, it is a failure. I hope some retaining-point man will try my method.

Items of Interest.

British Journal of Dental Science.

LONDON, MAY 1st, 1891.

ICONOCLASTIC PAPERS.

THERE are, probably, very few people now-a-days who would care to be called iconoclasts. It is perfectly true that the word may only mean a breaker of images, but images are now looked upon as works of art, and to be a destroyer of such is, in this nineteenth century, to be altogether outside the pale of civilized society. From a religious point of view it may well be doubted, whether images have not to a great many people as full a significance now as they had in days of old, and, possibly, there may be just as much call for the iconoclast, for the image breaker, now as then. But then, are we not all artistic now? We all paint, or love paintings, or pose as critics, as connoisseurs, as collectors; in short, we are all so artistic that if there be one word we would abhor being applied to us it is the word iconoclast.

Dr. Collins may, therefore, have regarded the remark of the President of the Odontological Society, as rather a left-handed compliment, when he heard his really excellent paper, read at March meeting, described as "this iconoclastic paper." Yet, in truth, there is much need for such papers. Without going into the question of whether some ocular and dental affections are so interdependent as we have hitherto believed, but over which belief Dr. Collins threw cold water in such a vigorously quenching manner, we readily enough admit that there are a whole heap of theories and facts (so called) which are simply empty bubbles, and which it is a charity, on the part of anyone, to prick, empty, and give a decent burial.

The truth is, we are all too anxious to discover some new thing ; we notice some peculiar coincidences, we assume they are consequences ; we build up an airy theory to connect them and satisfy our desire for continuity ; and we continue our observations in order to *support*, rather than to *verify* our original idea. Now, this version may seem a little far fetched, a little too crude, and we will willingly hope, that, in the majority of instances, it is so ; but we will still maintain that if men spent but a portion of the time they spend on making theories in observing and recording occurrences, we should get along a little more quickly towards the real truth of the various questions. A man's life is too short, his opportunities are too limited for any one man's observations to cover any very extensive field. He meets with a number of cases which seem to point to some definite conclusion, but it is conceivable, nay, it is often proved, that had he been able to continue his work for a longer time, had he more cases under his notice, his later observations would have tended to negative, alter or modify his original conclusions. So it is that such papers as that of Dr. Collins do such valiant service, for not only have we a second man's work and thought tacked on to that of the first, but the cobwebs are swept from our own eyes, and we begin to regard things from a new and more natural standpoint. Given a man of acknowledged position, worth, and opportunities for forming an opinion ; given that he lays down the law in certain terms ; it will follow that most of us, having less *data* on which to form our opinion, will accept, and endorse his, and in future observe all such points through his pair of spectacles. Now, this will not only prevent our detecting errors, if errors there be, but will actually elevate such into the position of accepted truths ; they creep into textbooks ; they are copied from one to another ; they are taught in the schools ; red-tapish examiners expect them dished up by the would be successful candidate ; time gives them its impress, until the idols become so firmly planted in their niches, that, even though they be proved false, the labour of dethroning them is hardly second to that spent in the rearing them up. We are, therefore, indebted to the iconoclast, who,

with hammer and pick, assails them in early days. Such "iconoclastic papers" are of as much value as, perhaps, of greater value than those which are records of original work. We have need of more such.

A curious find of mercury has been made, according to a correspondent of the *Pharmaceutical Journal*, in the centre of a trunk of a walnut tree, measuring about four feet in diameter, which was being cut in a timber yard. The mercury was in a hole in the centre of the trunk, which had been bored out and then plugged up, after inserting the mercury, with a deal plug, round which some eighteen inches of walnut wood had since grown. Considering the very slow growth of the walnut a tree of the size mentioned would be several years old, and it is conjectured that the hole, containing the mercury, must have been made at least two centuries ago.

Mr. Thiselton Dyer, Director of the Royal Gardens, Kew, says that there is an old belief prevailing in country districts that when a tree is infested with insect plagues of any sort it may be cured by boring a hole obliquely in the trunk and filling it with mercury. This, he suggests, is no doubt what was done in the case cited, and he adds that he has seen the experiment tried on a cherry tree, though, of course, without effect. The Chinese have a similar notion. They profess to be able to restore *Cycas revoluta* to health by driving an iron nail into the stem.

We have often taken the position with regard to infringements of the Dental and Medical Acts that the burden of prosecution and enforcement of these acts lies rather with the

public than with the professions. And we have maintained this on the ground that these acts exist for the purpose of guiding and guarding the public. Such a view, however, is not often taken by lay Journals, on the contrary they delight to raise the cry of professional jealousy, of would-be professional monopoly. It is only occasionally that we find our view endorsed by these Journals and then usually when, engrossed in discussing some other questions, they are, as it were, off their guard. Such an instance recently occurred in an evening paper when speaking of the opposition to some of the schemes of the Royal British Nurses' Association. It says :—The object of the Association is to give the public the same guidance, in the case of qualified nurses, as it already possesses in the case of doctors and chemists." Here then is our principle admitted, would that they would also admit its corollary.

Dr. GEORGE JOHNSON, F.R.S., has recently read before the Royal Society an interesting paper "On the Physiology of Asphyxia and on the Anæsthetic action of pure Nitrogen," which has been republished in the *Lancet*. With regard to the Physiology of Asphyxia, Dr. Johnson holds that the cause of death is due to arrest of the pulmonary circulation by a contraction of the pulmonary arterioles, brought about by the circulation in them of the venous blood. This is in opposition to the more generally accepted view, that death is due to paralysis of the cardiac muscles, in consequence of the circulation of unaerated blood through them. Dr. Johnson thus sums up the facts supporting his view :—"1. When the chest of an animal is opened immediately after death, caused by ligature on the trachea, the right cavities of the heart are found enormously distended, while the left are comparatively empty. 2. When the heart of an animal is exposed during the progress of asphyxia the right cavities are seen to become distended, while the left cavities, which had been previously gorged, are found to be collapsed and comparatively empty

3. In the last stage of asphyxia, there is a continuous increase of pressure in the pulmonary artery, while the systemic arterial pressure is falling. 4. That the arrest of the circulation through the lungs is due to contraction of the pulmonary arterioles appears to be proved by the influence of agents, which are known to paralyse the arterioles—e.g., nitrate of amyl, atropine, and an excessive dose of curare, the effect of which is that deprivation of air is unattended by distensions of the right cavities of the heart, and other evidence of obstructed pulmonary circulation, the life of the animal is prolonged for several minutes, and death ultimately results from the toxic action of venous blood upon the cardiac and nervous tissues. 5. It is an acknowledged fact that these paralysing agents act alike upon the systemic and the pulmonary arterioles, but the successive phenomena of asphyxia are absolutely inconsistent with the idea that the distension of the right side of the heart is a result of systemic arterial obstruction acting backwards through the left cavities of the heart and the lungs.”

Dr. JOHNSON'S experiments with Nitrogen have been conducted in conjunction with Mr. Frank Braine, at King's College Hospital, and Dr. Frederick Hewitt, at the Dental. Dr. Johnson says :—"In every case the result was the production of complete anæsthesia, with general phenomena precisely similar to those observed during nitrous oxide inhalation. The pulse was first full and throbbing, then feeble. In the advanced stage the respiration was deep and rapid, and there was lividity of the surface : the pupils were dilated, and there was more or less jactitation of the limbs. The only difference, in the opinion of some of those present, being that the anæsthesia was less rapidly produced, and some what less durable, than that from nitrous oxide, though, in each case, the tooth was extracted without pain."

WITH DR. HEWITT he also tried the effort of administering mixtures of Nitrogen with 3 per cent. by volume of Oxygen and with 5 per cent. with the following results :—"In the case of the 3 per cent gas, which was given to five patients, the time required to produce anæsthesia varied from 60 to 75 seconds, the average time being 67·5 seconds. In each case the tooth was extracted without pain, the duration of anæsthesia being somewhat longer than with pure nitrogen. In each case there was lividity, dilation of pupils, and more or less jactitation. On the same day Dr. Hewitt gave nitrogen with 5 per cent oxygen to four patients. With this mixture the time required for the production of anæsthesia ranged from 75 to 95 seconds, the average being 87·5 seconds. In each case there was complete anæsthesia, during which one patient had three molars extracted, and though she said she "felt the two last," the sensation appears to have been that of a pull, and not that of acute pain. In all of these four cases there was slight lividity before the face-piece was removed, but in only one case was there slight jactitation of the limbs. The other three patients were perfectly quiescent. The experiments here recorded suffice to prove that nitrogen, pure or mixed with a small proportion of oxygen, is as complete, and apparently as safe an anæsthetic as nitrous oxide."

We are glad to note that the Dental Societies will be represented by delegates at the International Congress of Hygiene and Demography, which will be held in London from August the 10th to the 17th. Messrs. Howard, Mummery & Sewill will represent the Odontological Society, and Messrs. Paterson & Smith Turner the British Dental Association. The objects of this Congress may be expressed in one word :—Health. The health of the community and all that relates thereto. As dentists, we are as a body much concerned with the neglect of the teeth of the children of the poor. Here is a subject on which the delegates can make themselves heard, with advantage.

Abstracts of British & Foreign Journals.

THE GERMAN DENTAL JOURNALS.

The *Deutsche Monatsschrift für Zahnheilkunde* for April, in addition to articles by Dr. Morgenstern, of Baden-Baden, on "A NEW METHOD OF FASTENING CROWN AND BRIDGE-WORK" and by Dr. J. Albrecht of Frankfort on "A CASE OF IMPLANTATION," contains also an article by SCHMIDT of LÜBECK on some CASES OF FRACTURED MAXILLÆ. The only novelty we note in his method of treatment is the application of a plaster and elastic bandage in place of the ordinary chin-cap and figure of 8 bandage. This is made as follows. Having rubbed the skin with some fatty substance a thin layer of cotton-wool is laid over the bony prominences of the lower jaw and then a broad gutta-percha bandage is passed under the jaw and fastened over the vertex. Over this is bound some layers of gauze impregnated with plaster, in the manner it is used when applying an ordinary plaster splint. When set the plaster is cut away so as merely to form a splint for the jaw, the elasticity of the rest of the bandage is thus allowed to come into play, with such a bandage the patient can open and shut his mouth and yet the jaw is supported.

In a paper on "PYORRHŒA-ALVEOLARIS," DR. G. P. GEIST draws a distinction between this disease and a similar condition brought about by neglect of the teeth, accumulation of tartar and consequent inflammation of the gums in uncleanly people. He is of opinion that true Pyorrhœa Alveolaris is most frequently met with in people who are well nourished and who have paid great attention to cleansing their teeth. He states that the teeth of such patients have a noteworthy glassy appearance which simulates the polish on Ash's artificial teeth. The ring of tartar found always within the gum margin differs from ordinary tartar (which is green or yellow) in being black, due to admixture with the colouring matter of the blood, moreover, in cases which are due to the mechanical irritation of the tartar, cure follows its removal, but in the true disease it by no means necessarily does so. Dr. Geist has never met with the disease in patients under thirty years of age, though only too frequently after. As regards treatment, he first removes all tartar and polishes the teeth till they are smooth. Then he takes a wisp of cotton-

wool wound round a nerve extractor and moistens it in a 15 to 20 per cent. solution of zinc-chlorate and passes this round each tooth reaching as far up the pocket of gum as possible. The cotton wool is burnt off the instrument and a fresh wisp used for each tooth. This is repeated every other day till the teeth begin to become firm, and afterwards every other week.

DR. H. HILLISCHER, of Vienna, gives, in the same Journal, his method of performing Znamensky's operation of implanting artificial teeth. He has had no great experience of this but believes, on theoretical grounds, that it is correct.—1st. He cleans out, and if need be, enlarges the socket, using cocaine as an anæsthetic, then he renders it aseptic with Peroxide of Hydrogen and also checks any bleeding. 2nd. He has prepared a tooth from one of the fanged teeth used for continuous gum work. This he does by fastening half a gold or platinum tube to the back of the root, by means of its pin and a piece of wire twisted round the whole and fastened. When finished this is washed first in dilute sulphuric acid, and then in pure water. 3rd. The socket is sprinkled with Iodoform or Aristol powder, and the tooth is then introduced, and is retained in place by a piece of rubber-dam which is folded over it and the adjacent teeth to some of which it is fastened. If the appearance of this is objected to, the tooth is fastened with thread or wire. Dr. Hillischer sees the patient twice a day for the first 3 to 4 days, then daily till the 12th or 20th day, when the tooth should be firmly held. He regards the operation as especially indicated where only a single tooth is lost.

THE INFERIOR MAXILLA AND ITS RELATION TO THE SEVEN AGES OF MAN.

BY ROBERT M. SOLOMONS, D.D.S., Charleston, S.C.

AMONG all the two hundred bones of which the human frame is composed, there is none, perhaps, more calculated to excite the interest and admiration of the student than the inferior maxilla. In the variety of its features and the diversity of its functions it has no equal in the entire animal economy. Whether considered from the dental standpoint or in its relation to physiology, anthropology, physiognomy,

or geometry, it is none the less interesting. To the dentist, familiar with the essential part that this bone plays in the development, eruption, and maintenance of the teeth, nothing need be said in this regard, nor of its all-important relation to the functions of speech, mastication, and digestion ; while to the mathematician the directing hand of an all-wise Master Mechanic speaks from its every angle and part, and is everywhere shown in the employment of apparently insignificant advantages and the accurate adjustment of each particular part for the performance of the work of the whole.

There is law and order pervading every part of the jaw, a wise design being apparent in the arrangement of the teeth and jaws in consonance not only with the laws of geometry, physics, and mechanics, but according to the most approved methods of modern science for the economy of force.

To the naturalist and comparative anatomist what can be more interesting than the articulation of the human jaw ! A triple arrangement of the inferior maxilla with the temporal bones in such manner as to combine the advantages of the perpendicular, hinge-like joint of the carnivorous animal with the flat socket or laterally moving joint and the long, narrow articulation which gives the backward and forward movement of the ruminant. Man is, therefore, omnivorous, and here is found one of the many proofs of his position as head of the animal kingdom.

When we look at the bone through the eyes of the anthropologist, we find that as a means of racial distinction it presents landmarks as fixed and reliable as any to be found in the skeleton. In the Caucasian race, for instance, we have the shortening of the jaw and perpendicularity of the front teeth such as to give rise to that prominence of forehead and chin so characteristic of the face of the well-formed European and his descendants. The inferior maxilla of the negro, on the other hand, exhibits closer approximation to the lower order of vertebrates in its greater massiveness, the depth of its body, the slant backwards of its anterior alveoli and teeth, and in the greater obtuseness of the angle of its horizontal and ascending portions, the last-mentioned fact being of special importance to the dentist as accounting in a measure for the less frequent occurrence of trouble and irregularity in the eruption of the lower wisdom-tooth among black people than among whites.

To Dr. Henry C. Boenning, of the Philadelphia School

Anatomy, belongs the credit of having made a discovery which further increases the value of this bone as a means of distinction between the races ; namely, the peculiar relations which the alveolar sockets bear to one another. Given, for example, an inferior maxillary bone with all the teeth removed, but their sockets so preserved as to show the direction of their vertical and transverse axes. If now a section be made a few lines below the free border of the alveolar process so as to bring the openings of the alveoli on the same plane, such a section will exhibit a series of ellipses, each socket being conoidal in form, with the base of the cone at the place of opening. If the long axes of these ellipses be now successively extended inward so as to intersect a line drawn antero-posteriorly from the nasal spine to the occipital protuberance, it will be found that their several points of conjunction will form a series of constantly increasing angles. This, as a general rule, is found to be the case in the higher races of mankind, and in passing backward from the incisor to the molar teeth the angles gradually increase to such an extent as to finally exhibit an approximation to a right angle. As we descend in the scale of humanity, the lower the race the less pronounced the angle. In the descending scale irregularities frequently occur, so that instead of the angles uniformly increasing, the axial lines not infrequently intercept one another. The well formed dental arch in the higher types of mankind, will, however, clearly exhibit the increasing angles of the conjugate axes of the teeth with reference to the antero-posterior line though the middle of the base of the skull.

These conclusions, reached by Dr. Boenning after several years' consideration of the subject, were confirmed by the examination of a large number of skulls in the fine collection of crania at the Academy of Natural Sciences.

One of the most remarkable and interesting features of the inferior maxilla is its difference in form and character at various periods of life. From the time of birth to the time of death it is constantly in a state of transition. The changes vary according to the life of the individual, and may be said to correspond with the seven ages of man as depicted by Shakespeare.

Take for illustration, the natural anatomical history of the inferior maxillary bone of an individual of ordinary longevity. At birth the bone is still in halves ; the dental groove is of

considerable magnitude and runs along near the interior border of the bone ; the alveolar arches, containing the germs of the teeth, are large and prominent ; the coronoid process is of large comparative size, and stands up boldly at right angles from the rest of the bone. The body and ramus form an angle of from one hundred and sixty to one hundred and seventy degrees, and this straight configuration of the jaw together with the non-development of the antrum of Highmore gives the rounded, flattened face of the "mewling, puking infant."

Later the two parts of the bone become united at the symphysis menti, the first dentition is completed, the angle of the jaw is reduced to about one hundred and thirty degrees, and simultaneously with the eruption of the permanent teeth we have the appearance of the "whining school-boy, creeping unwilling to school."

At the age of about twenty years the angle of the jaw becomes about one hundred and ten degrees, the second dentition is about being completed, the dental canal is in the middle of the bone, and the face of the individual assumes that symmetry of outline and beauty so characteristic of the ideal "lover, sighing like a furnace."

Later on these give place to the sternness and decision of mien which so become the "soldier, jealous of honour and quick in quarrel," features which are supposed to be the outward signs of a jaw-bone dense and solid in structure, sharp and well defined in outline, with the vertical and horizontal portions nearly at a right angle and the alveolar and basilar portions so nearly counterbalancing that the mental foramen now stands about midway between the superior and inferior borders of the body of the bone.

Next comes the "justice, full of wise saws and modern instances." At this age of life, about forty-five years, most people, especially the learned members of the judiciary, have cut their wisdom-teeth, but the coming of the *dentes sapientiæ* has been followed, perhaps, by a compensating loss in the evenness and continuity of the structure of the bone and other changes indicating that the climax of life has been reached or passed.

It is not, however, until the individual has shifted into the "loose and slippered Pantaloons, with spectacles on nose and his big, manly voice turning again toward childish treble," that the shrinking of the alveolar process, the loosening of

the teeth in their sockets, the spreading of the angle of the jaw, and other signs of retrograde metamorphosis make themselves apparent.

The seventh and last stage is second childhood in the individual, corresponding to the edentulous state of the bone in infancy. As the years advance, the alveolar process is absorbed, the teeth drop out, and the bone again becomes shallow. Whereas in infancy the alveolar process constituted the chief element of the body of the bone, it has now become absorbed and the lower or sub-dental portion only remains, so that the mental foramen, which had been near the lower margin of the bone, is now found quite near the upper edge. In order to permit the jaws, now deprived of their teeth and alveolar process, to be brought into something like approximation, the angle of the jaw has again become widened to about one hundred and thirty-five degrees. As a consequence of these changes the jaw is elongated and the chin thrown forward, so that when the mouth is closed the chin and nose approximate each other. Then it is that the individual, "sans teeth, sans eyes, sans taste, sans everything," at last reaches the state of dissolution, his jaw-bone having completed its wonderful cycle of transformation.

Cosmos.

NICKEL AND PLATINA DISCOVERED IN CANADA.

By W. ADAMS, of Whitby, Ontario.

HAD the news been heralded throughout the world that the precious freight of the sunken treasure-ships of all ages had drifted together at a place where men could go and take their pick of piles of gold and handfuls of glittering gems, it would not have meant more than the tale of Aladdin-like discoveries coming from the Sudbury district, Canada. So marvellous were these stories of the sudden discovery of great wealth that the people naturally paid but little attention to them, for fairy tales have not much charm for a people whose every tradition, and whose constant experience, unite to teach them that wealth comes by hard work and not through the agencies of genii of the lamp and ring, or by gifts from fairy

godmothers. Nevertheless, the more often the story is repeated, and the more fully the case is investigated, the more matter-of-fact and marvellous do the facts appear.

It is generally known that recent experiments made by experts in the making of ironclads and heavy ordnance have proven that the iron-plated cruiser is a mere card-board affair compared with what it might be if the armour plates were made of nickel-steel, that is, of steel with an admixture of nickel, and also that the playful fashion that great guns have of bursting and carrying the fragments of themselves and the people who operate them to indefinite distances may be checked, if not wholly overcome, by using metal of the same kind. This putting of good material into engines of destruction is a poor business at best, but the governors of the world find if it is to be done at all they must keep up to the times, and so they have begun to look over their resources with a view to purchasing an outfit of the new material. Since the "wooden walls of England" have been blown out of the water or relegated to undignified obscurity as hulks, Iron has been king in the armaments of the world. He still reigns, but his sway is disputed, and if he is to retain his throne. it must be by taking the beautiful Nickel for his queen, and sharing the throne and sceptre with her. Unless some new and unheard of invention revolutionizes modern industrial methods, iron with nickel must hereafter be used where density and power of resistance are required.

But the question present in the minds of those who desire to take advantage of the new facts which science and experiment have revealed is, Whence the supply? Though nickel became known in 1751, was not until 1875 that much was found. And as the discovery was made in the French penal colony of New Caledonia, the French have till lately kept it to themselves. During the American war nickel was worth 2.50 dols. a pound, now it is about 50 cents.

Three years ago ore was sent to New York from the Sudbury district to be smelted. The ore was believed to be invaluable for its copper, and it was hoped that fortunes would be made in working the mines. The smelting process revealed the presence of nickel in very considerable quantities. The fact was reported at the time, and ever since the wonder of the nickel mines has grown.

AN OFFICIAL INVESTIGATION.—At its last session the congress of the United States appropriated 1,000,000 dols to be

used in making nickel-steel armour plates and ordnance. Before the expenditure of this money was entered on, the Navy Department took steps to make certain that the work would not be interrupted for want of supply of nickel. The Secretary of the Navy appointed two commissioners to visit the nickel-bearing district to investigate fully and report to him. One of the commissioners was Commodore Wm. M. Folger, Chief of the Bureau of Ordnance, the man who is charged with the responsibility of turning out the guns and armour plates. The other Commissioner was Lieut. B. H. Buckingham, one of the most trusted officers of the department, as shown by the fact that he is in charge of the flagship Chicago, the leading ship of the navy. Lieut. Buckingham has special qualifications for conducting an investigation such as that committed to himself and his fellow-commissioner, for he accompanied Sir Charles Tupper, Canadian High Commissioner at London, and Mr. S. J. Ritchie, of Akron, Ohio, President of the Canadian Copper Company (proprietors of some of the best nickel locations) in an extensive tour through Europe, investigating the process of manufacture for ironclads now carried on, and the present requirements for nickel. It may be stated, in passing, that these gentlemen found that the leading makers have orders on hand for materials made of the nickelsteel, but these orders were not then being filled, because the nickel necessary for the purpose could not be found. Commissioners Folger and Buckingham reported to the department under date of October 14th, 1890. Their report is interesting reading for Canadians, as its cold, official language gives the most complete confirmation of the reports of untold riches in the nickel-bearing ores of the Sudbury district. The commissioners tell how they visited the district, and go into details of what they saw and learned. They make this statement as preliminary to the detailed report:—"We are fully convinced, from the surface indications and the shafts already sunk, that they have an amount of mineral which cannot be exhausted by this generation." The borings made and the shafts sunk are a mere nothing as compared with the immense quantities of nickel-bearing ore in sight. The fact that these officials should come to such a conclusion, as they did, give some idea of what may ultimately be expected of this region. They go on to say that the deposits of nickel lie between walls of granite and diorite and are easily to be distinguished. This fact shows that there was absolutely no danger of the commissioners being deceived by mere surface indications.

TREATMENT OF THE ORE.—But not only is the ore easily distinguished, but it will be easily handled when branch railways are built to the mines. The report states that the country for hundreds of miles is broken by rocky ridges from 100 to 600 feet high, with bare rocks cropping out in many places and the rest covered by a thin soil on which are pine forests. "Between the hills are marshy valleys and numerous lakes and streams capable of furnishing abundant water power." And again :—"It is important to notice, from an economic point of view, that these ores can be smelted in their natural state, that is, they do not require the admixture of fluxing substances. The dead pine timber found in great abundance in the neighbourhood, and which can be delivered at the furnace at 1.80 dols. a cord, is a good fuel for roasting, though hardwood would be better, but owing to the fusible qualities of the ores and the intermixed rock it answers the purpose. Coke is hence the only material that has to be brought from abroad. This is procured from Pittsburg, and can be delivered at the works at 7 dols. a ton."

The meaning of this is not quite clear to the uninitiated, but it is explained later in the report. The fact is, the rock when blasted out is roughly sorted, so as to exclude those portions that are valueless. The ore is first "roasted," that is to say, the ore and dead pine timber are placed together in immense quantities, and the wood is set on fire. The effect of this roasting is to release the greater part of the sulphur, which rises in an immense cloud during the many days while the roasting is going on. There still remains about 7 or 8 per cent of sulphur. The ore thus purified is treated by a smelting process, and it is in this that the coke is used. The material which results from this process is known technically as "matte," and contains copper and nickel in varying quantities. The "matte" is exported to the United States, where the final process of extracting the fine nickel is carried on.

THE EXISTING WORKS.—The report goes to show that there are two companies now engaged in the work of mining nickel, the Canadian Copper Company and the Dominion Mineral Company. The commissioners visited the district in company with Mr. Ritchie, who gave them every facility for examining the locations and the mines. The other company also seems to have afforded every information.

THE MINES.—The properties of the Canadian Company are very extensive, and have the largest out-put. The commissioners devote separate heads of their report to the Copper Cliff mine and vicinity, the Stobie mine and vicinity, the Evans mine and vicinity, the Vermillion mine and vicinity, and the deposits in Creighton township. The place where the most work is being done is the Copper Cliff mine, which is situated within four miles of Sudbury, being connected with the Canadian Pacific system by a branch railway. The furnaces turn out about 60 tons of matte, which averages about 17 per cent. of nickel and 23 per cent. of copper. The mining is not confined to the surface, but has already been carried down a considerable distance. The ore seems to be as rich as at the surface, indicating that the resources of the place are simply boundless. One advantage of working underground is that operations can be carried on about as well in winter as in summer. In the biting cold of the winters of this region work in the open air would be tedious and expensive. The company has an excellent plant, and carries on the work now at a minimum of expense. The crushing capacity of the machinery already placed is understood to be about 1,200 tons of the crude ore a day. The company, it is stated, already has on the ground, and ready to set up, machinery which will bring the capacity up to 6,000 tons a day. The vicinity of the Copper Cliff mine, as indeed the vicinity of all the others, is found to be exceedingly rich in nickel-bearing ores.

IS THIS ANOTHER BONANZA?—At the Vermillion mine a unique discovery has been made in the form of arsenide of platina, a metal hitherto very limited. The commissioners report that this new metal has been named "Sperryolite" by the Sheffield School of Yale University, in honour of its discoverer, Mr. Sperry. The metal is found by washing the sand, which yields 70 ounces of platina to the ton. No indication is given in the report of the value of this discovery. It is well understood that platina now is one of the most valuable of metals. Its refractory nature makes it invaluable for use in electric lighting. The small supply and the comparatively large demand have run the price up till now platina ranks with gold in value. The sources of supply are various—Russia and the Pacific Coast, north and south of the international boundary, being the principal. The discovery of sperryolite may mean that the prolific Sudbury

region will add another to the list of signal advantages which it confers on the world.

STILL MORE NICKEL.—The deposits in Creighton township have not yet been worked ; in fact, they have hardly been seen by any except the prospectors on behalf of the Canadian company. The commissioners speak of these deposits as being “in size more striking than any we saw.” It is understood that the company will soon build a railway to this location either from Copper Cliff or from the Canadian Pacific main line, with a view to beginning operations there also. The locations of the Dominion Mineral Company visited by the commissioners are the Blezard mine, the Worthington mine, the Crean mine and the Murray mine. In these places also they saw work going on with indications of valuable nickel deposits. They report statements made to them that the nickel-bearing ore extends to the north indefinitely, but they do not undertake to speak as to the truth of these statements. The report closes with a summary in figures. They give an “estimate of tons of ore above the surface of the ground in deposits seen by us 650,000,000.” These figures as they stand mean nothing to the ordinary reader ; the mind cannot conceive the quantity thus indicated. It is an amount equal to five times all the iron that has been taken out of the rich mines of the Lake Superior District (American side) in the whole forty years of their working. If this ore were raised and shipped it would give more than three times as much freight as the whole of the railways of Canada have carried since the first locomotive began to run. The amount of ore taken from the mines up to October 1st is about 175,000 tons. The daily crushing capacity of the machinery at work on the ground is about 1,750 tons, and the daily furnace capacity of matte is about 100 tons. With such a report the American Government may feel quite confident, and the world may share the feeling, that the question of the supply of nickel for armament or other purposes presents no difficulties.

Items of Interest.

DECAY OF A REPLANTED TOOTH.

BY W. D. MILLER, M.D., D.D.S., Berlin.

HOWEVER solidly a house may be built, an extra nail or two may do good service when the winds blow and the rains beat upon it.

The chemico-parasitical theory of dental caries has every appearance of being built upon a solid foundation, and the various storms thus far encountered have produced not even a vibration in its framework. Nevertheless, having a nail at hand, we will drive it home, since a structure which must bear the test of ages and upon which the whole superstructure of a rational dental practice must be built cannot be too well supported. We can never learn too much about the chief source of all the many ills it is our province to deal with.

Decay of living teeth, of pulpless teeth, of dead teeth; decay of dogs' teeth, horses' teeth, etc., and artificial decay, have all been the subject of various contributions to dental literature; but the appearance of decay in a replanted tooth has, as far as I am aware, as yet received no attention.

The tooth in question was extracted by mistake about the first of October, 1888. After it had been out of the mouth for a fortnight the point of the root was removed, the canal filled with oxychloride, and the tooth forced into place.

When I first observed the tooth, two years later, there was a chronic fistula at the point of the root; but notwithstanding this the tooth was quite firm. It had been filled with phosphate cement before replanting, but at the time of examination no trace of the filling was left. As the tooth was filled out of the mouth, this filling furnishes an interesting test of the durability or reliability of phosphate cement under the most advantageous circumstances. We should really have expected the filling to last longer. Perhaps the particular preparation used was at fault. The cavity was lined with a thick layer of soft dentine, as we find it in acute caries, the removal of which reduced the tooth to a mere shell, and revealed at the same time the fact that the cavity on the distal surface communicated with a smaller one on the mesial.

Microscopically and physically examined, the decay presented nothing to distinguish it from an ordinary case of acute decay. The decayed tissue had a brownish-yellow colour, an acid reaction, and had lost about thirty-five per cent. of its lime-salts.

Sections of the decayed dentine made on the freezing microtome and stained by the Gram-Günther method showed that, while the deeper parts had undergone no structural changes whatever, the more superficial layers were permeated by enormous masses of bacteria, which had distended the tubules to several times their normal diameter, and in many places had destroyed the basis-substance, giving rise to caverns or liquefaction-foci, and finally to a complete destruction of the tissue.

A higher power of the microscope (350—1200) showed that the decay was caused by a so-called mixed infection, not only micrococci, but in some places bacilli and even very long, much twisted and contorted threads being present. The contortion of these threads resulted simply from the contracted space in which their development took place, and not from any natural tendency of the threads to take this shape.

The preparations also showed the fragmentation of the tubules or breaking up into short pieces, resembling pipe-stems. It is much to be hoped that some satisfactory explanation of the origin of this appearance will soon be furnished. As much as has been written about them, we are still absolutely unable to account for them. We have thus far only succeeded in showing that they are not the result of any vital action, since they occur in artificial caries also.

We find, consequently, by the examination of this case of decay of a replanted tooth, that the same chemical, physical, and structural changes have taken place as in the ordinary cases of decay met with every day.

We also find the same agents, viz., bacteria at work in bringing about these changes. Wherever and under whatever conditions decay of dentine has been the object of exact study, the same phenomena and the same etiological factors have been found, and the mass of evidence already heaped up in favour of the chemico-parasitical theory of decay leaves very little to be desired in the way of conclusive proof of the correctness of the theory.

Cosmos.

BROKEN INSTRUMENTS IN ROOT CANALS.

By WILLIAM CONRAD, D.D.S., St. Louis.

In operating upon pulpless teeth, the best thing to do in order to insure your future comfort, is not to break the instrument off; but this would be out of all human power, as such things have happened and will happen again to the most careful of dentists, although at the time of such accidents the feeling is that carelessness has been the cause of our misfortunes.

A dentist who says he never breaks instruments in root canals, must be one who never treats and fills pulpless teeth. I believe there are some such people still alive, although their numbers are not so numerous as formerly.

The kind of broaches to use, in order to get the best results, is an important consideration. For general use, I prefer the Jeweller's Swiss broach, Nos. 6-8, temper drawn to a spring, at the time of using, dressing the surface with an emery disc and burnishing with pliers. This gives a smooth, flexible instrument now ready for use. Sometimes I have to sharpen the point for difficult work.

Gold, platinum, gold and platinum, etc., have been recommended as materials for broaches, but I cannot see any advantage in their use over the steel instruments. They will break as readily as steel, and as it is not from the corroding of the piece left in the canal that we have the most to fear, we can gain nothing by their use. It is from a blocking up of the canal in such a way that the root cannot be properly treated and filled, or by forcing the point through the apical foramen, that we expect the greatest danger.

Never use a broach many times. If a new one is selected for each case it might save us hours of annoyance, and perhaps some professional credit.

Never twist a broach in a canal; although we may be sorely tempted so to do, we are likely to twist once too often. There are more broaches left in roots than all other instruments combined. I am glad to learn that their use is going out of style, and I hope they may never become a necessity again.

From my observation, the greatest number of dentists make use of mechanical means to get the pieces out of the canals. This method is all very well, if we succeed, but in case we do

not accomplish our object, it leaves the case in a much worse condition than if we had never made the attempt. If the effort at removal has not been successful the broken instrument has been forced more firmly into the canal, leaving a space beyond which cannot be treated or filled, setting up a low form of inflammation, and being always a constant reminder that abscess is liable to follow, unless the end of the root becomes encysted, and to my mind a permanent case of this kind of relief is rare, and not to be relied on for safety. If the instrument is forced through the apical foramen, this condition to me would mean the final loss of the tooth. In such cases as this, gold, platinum, gold and platinum broaches do not make a good root filling, as some of our brothers a few years ago stated as a reason for the use of the other metals than steel in the manufacture of broaches.

The action of chemicals upon metals seems to me to be the ideal plan for solving this difficulty. Some acid which will dissolve the broken instrument, thus doing away with the necessity of disturbing it by any mechanical effort, and when it has been sufficiently softened, allowing us to wash out the remaining debris, would be, to my way of thinking, a blessing to dentists of to-day. How to do this is a question I would like to have answered. Such a chemical should act more rapidly upon the instrument than upon the tooth substance, and there will be the difficulty, as everything I have used requires a greater quantity in contact with the metal than we get there, or will act too rapidly upon the root.

Chemicals used for this purpose are numerous. None of them can be relied on at all times. Common salt has been recommended, but it will not do the work. Hydrogen dioxide pumped into the canal and around the piece, should do it, but will not. Bichloride of mercury, forced around the broach, does not seem to care for the task.

Sulphuric acid I have tried with fairly good results. It certainly will do no harm, and is worth a trial in case of necessity, as it softens calcified pulp matter and gives you more room to better treat the roots.

Nitric acid is one of the most certain means we have to use, although the danger in its use makes care a great necessity. I believe I can remove any steel instrument from a root by its use. I use it diluted, and the gold broach wrapped with cotton as my means of applying it. In some desperate cases I have taken advantage of it, and have not been sorry.

In conclusion, let me say, it is a misfortune that sometimes our patients will go visiting the other dentist, just when we would prefer all of their company ourselves, and it is a consolation for some of us to know that it is not always the most unskilful dentist who pushes the broach the furthest through the apical foramen.

I certainly would not tell the patient the instrument was in the root ; it will do no good, and many times may do harm, both to patient and dentist.

Archives of Dentistry.

PATHOLOGICAL DENTITION.

By JAMES W. WHITE, M.D.

That the period covered by the first dentition is that during which the greatest number of deaths occur among children is a fact which is not disputed. It is also a fact not admitting of question that during this time, more than in any subsequent like period of childhood, important structural changes are taking place in the organization of the infant, constituting, as analogous changes in after life are denominated, a veritable crisis or critical period. A special liability to an increased nervous susceptibility when other structural and functional changes in the economy are progressing is recognized by all medical practitioners, and is a reasonable assumption, even if not demonstrable, in the case of the infant, when such notable modifications are taking place. The wonderful mobility of the nervous system in infancy, the tendency to reflex phenomena, the liability to serious disturbances from slight causes, of organic changes from functional derangements, of dangerous reactions from local irritations, are all acknowledged, are all readily explainable, and are all urgent admonitions to the assiduous avoidance or correction of all peripheral irritations.

In view of these facts, the question whether the teething process may become a periphecal irritation is an important one. Undoubtedly, dentition is a physiological process, and under favouring conditions proceeds without any disturbance of the health of the child. Surgical or medical interference is then, of course, not to be thought of. But there are numerous cases in which the local evidences of irritation are unmistakable—cases in which the gums become tumid, tense, and

shining, swollen into little tumours over the erupting teeth ; exhibiting redness, induration, and sensitiveness to touch ; signs which in any other part of the organism would be recognized as manifestations of irritation. In addition to such local signs, the child gives indications, in fever, irritability, and wakefulness, of systemic disturbance without other recognizable cause ; the history revealing that, beginning with evidences of simple uneasiness, it has become by rapid stages fretful, cross, vindictive ; refusing to be amused, crying and screaming alternately, and thrusting its fingers into his mouth or pulling at its ears as though suffering from some overmastering excitement—the flushed face, the compressed lip, the corrugated brow, the clenched hand testifying of an unbearable torment. If relief is not afforded, what cause for wonder if there presently ensues the exhaustion of irritability, with nausea, vomiting and diarrhoea, or other systemic complications, possibly, nay, frequently, with fatal ending ?

That a perversion of the physiological process in infantile dentition may be the occasion of symptoms such as have been described, may be inferred from the severe and protracted suffering experienced in some cases from the eruption of the sixth or twelfth year molars or of the wisdom teeth. The eruption of these teeth is certainly none the less a physiological process than is that of the deciduous teeth ; but while as a rule the eruption of the permanent teeth is attended with little or no inconvenience, there is not unfrequently considerable swelling of the gums, and pain, sore throat, earache, difficult deglutition, and severe constitutional disturbance. In these cases reliable testimony can be obtained as to the local and reflex troubles, and also as to the effect of treatment. The testimony is that when the operation of lancing is intelligently performed the relief is immediate. What is the unspoken testimony of the child ? After hours, and days it may be, of unrest, without other treatment than the lancing of the gum over one or more teeth, a child will not infrequently drop at once into a long and peaceful slumber, waking with an appetite and becoming again the joy instead of the terror of the household. What is the explanation but an acknowledgment that if dentition at a later date though even in exceptional cases, may give rise to local distress and constitutional disturbance, it is not improbable that the same process may be the occasion of far more serious derangement in

the sensitive infant, on whom local irritations act with so much greater severity than they do upon the adult?

But the question is constantly asked: Why should the eruption of the teeth, if a physiological process, be the cause of irritation? The answer is that when the evolution is purely physiological there is but slight irritation; there are no morbid phenomena, and without doubt many infantile diseases have been attributed to dentition which had no relation to that process. But there are large numbers of children whose faulty organization, dietetic management, and general environment preclude the possibility of normal functional processes. Some suffer from neglect and insufficient food; some from too much care and overfeeding. In either case aberrations from normality are to be expected—reduction in the resisting power of the organism and increased susceptibility to depressing influences. The balance—a delicate one—being thus disturbed, functional inharmony created, there is a perversion of physiological processes which mutually react. Thus an aberration of the process of dentition may be the cause of an unfavourable modification or aggravation of a systemic disorder, or such disorder may as reasonably be deemed to exert an unfavourable influence upon dentition.

The eruption of a tooth as a physiological process includes the absorption of the tissues overlying it coincidently with the elongation of its root or roots, and the rising of the tooth in its socket. But when the advance of the tooth is more rapid than is the absorption of the superimposed tissues, the latter act as a mechanical obstacle, the tooth becomes in turn a mechanical irritant to the gums, and the usual results of a continued irritation of a tissue follow. The gums, which in a healthy state are comparatively insensitive, become exquisitely tender; so much so that in some cases it is manifested whenever the child attempts to nurse. But this hyperæsthetic condition of the gum tissue is not to be accepted as the only, nor even the chief, explanation of the untoward symptoms which ensue. The backward pressure of the resisting gums upon the nervous and vascular supply of the pulp is, it is reasonable to believe, chiefly accountable for the grave disturbances of health witnessed. If such a backward pressure is conceivable—and what is there to forbid the thought?—it furnishes the explanation of an eccentric irritation, a local disturbing cause sufficient to account for any disastrous re-

sults from its generalization. Assuming, then, that the chief trouble is at the root end of the tooth and is caused by compression of its nerve, what measure promises such immediate, such complete, relief as removal of the tension? Not a scarification of the gums, still written about as though that were what is understood by lancing; not for the purpose of blood-letting; not for hastening the teething, sneered at by a recent writer as though that were the object sought by those who advocate the judicious use of the lance; not as a routine practice, but simply and solely to remove tension—"only that and nothing more." The routinism which never lances is as unscientific as the routinism which always lances, and each is alike to be condemned.

While as a rule the evidences of aberration in dentition are to be found in a tumid, congested gum, it is believed that there are cases in which, though no local signs justify the diagnosis, the source of reflected trouble may depend upon the backward pressure to which allusion has been made. Certainly many cases have been known to the writer in which were displayed not only to an exceedingly unpleasant, but to an alarming extent, evidences of an unrest which could not be accounted for except on the supposition that the little patient was suffering from toothache. Every possible investigation having failed to discover other cause for conditions and actions resembling those of cases in which dentition was evidently concerned as causative, the lancing of the gums over the teeth next in the order of eruption, and which were making themselves recognizable by the natural enlargement due to their presence, was followed by an entire and welcome change in the conduct of the child, no medication whatever having been resorted to. A child does not without cause show continuous unrest; does not for days and nights together fail to procure reasonable sleep—the desire and effort to sleep seeming to be thwarted by fresh accessions of pain; does not moan in its sleep and wake up with a scream; does not resist every attempt to amuse it, treating the effort as an indignity; does not give evidence of some persistent annoyance by pulling its hair and its ears, thrusting its fingers into its mouth and chewing on them; does not add to such manifestations the refusal of its food, and then immediately following the lancing of its gums sink into a peaceful slumber, and on awaking give evidence of entire freedom from annoyance, without there being strong reason to believe that there was a

relation of cause and effect between the lancing and the improved condition which followed. Such cases are not altogether rare, and there are good reasons for the conviction of the writer that the irritation of dentition may give rise to pain so intense and unremitting as to destroy the appetite for food, to cause wakefulness, irritability, thirst, fever, diarrhœa, congestion, convulsions and death, without the existence of a single local indication. Assuredly it would seem justifiable in the presence of symptoms such as have been described, and in the failure to account for them by any recognized cause, to give the child the benefit of the doubt—if doubt there be.

A case of severe, alarming, and protracted illness of a child about fourteen months old occurred in the household of a friend of the writer. It was attended by two prominent physicians, whose interest in the case and the undefined character of the illness led to three daily visits by one of them and a daily consultation with the other. The child grew steadily worse, as was easily recognizable by the family and admitted by the physicians. The illness had continued for nearly two weeks, and hope of its recovery was well nigh abandoned. In the middle of the night the writer, living near by, while both of the physicians in attendance lived at a considerable distance from the patient, was summoned on account of the child being in convulsions. An immediate examination of the mouth revealed, what from observation of the symptoms he had surmised, the need of the lance over all the first molars.

This indication was promptly met, and the child was then laid upon the bed. With a long-drawn sob, as though relieved, it sank at once into a sleep which lasted for five hours, although it had not had fifteen consecutive minutes of sleep for several days previously. The following morning the child was so much better that every member of the family was convinced that the improvement was unquestionably the result of the operation. The physician did not admit it, although he did admit a rapid and complete recovery of the child. The next day terminated the consultations.

The impropriety of indiscriminate lancing need not be argued : it is self-evident. But when indicated, the arguments generally employed in opposition are puerile, if not ridiculous.

The conclusions arrived at by a recent writer concerning lancing of the gums are as follows :

I. "It is useless, *a* as far as giving relief to symptoms ; *b*, as far as facilitating or hastening teething.

II. "It is useful only as blood-letting and ought not to be used as such.

III. "It is harmful, *a*, in producing local trouble ; *b*, in producing general disturbance on account of hæmorrhage ; *c*, in having established a method which is too general to do specific good, and too specific for universal use."

That lancing DOES give relief to symptoms which indicate dental disturbances will not be denied by any one who has in any considerable number of cases intelligently observed. That it is useful *only* in blood-letting, is a claim that displays ignorance of the object sought in an intelligent use of the lancet in infantile dentition. That "it ought not to be used as such," (*sic* !) no one will dispute. That it produces "local trouble" or "general disturbance on account of hæmorrhage," is a position which indicates either a peculiar experience or unskillful operations, or it is a mere assumption.

The advocates of judicious lancing do not seek to establish a "general method" nor a "specific for universal use."

In an experience of more than thirty years, during which his opportunities and experiences in this department of practice have been somewhat exceptionally large, the writer has never seen "local trouble" produced by the lance, nor a hæmorrhage which called for any interference. When there was any considerable show of blood, it was from the instant discharge of that which was no longer in the circulation and had collected in a sac-like tumour over the tooth.

Undoubtedly there are many instances in which the irritation of dentition is coincident with other disorders not dependent upon that process, and in such cases the associated derangements demand appropriate treatment. But when the disturbance is due to tension, to the pressure of the unyielding gum upon the sensitive tissues at the incomplete foramen of the root, neither systemic medication nor scarification of the gums will avail. Scarification for the purpose of blood-letting may temporarily relieve the capillary distension, but is not an intelligent procedure, because, while involving every possible risk which might be urged as an objection to lancing it does not relieve the pressure as does a free, clean incision which liberates the tooth. The writer has had cases in which the lancet had to be carried quite a little distance through the gum before reaching the presenting surface of the tooth,

which, by the disappearance of the tumidity, was visible in twenty-four hours there-after.

The liability to any considerable loss of blood, which it is acknowledged is possible, cannot be very great; would certainly be almost surely prevented, if threatened, by any ordinary styptic such as alum in fine powder, or by a little pressure and such slight liability must be accepted; a wise discrimination avoiding operation in cases especially threatening either by systemic condition or family history. Medicine and surgery are alike a choice of evils, and to choose the lesser evil is the aim of all practitioners, one cannot escape risk of error by simply doing nothing. The *cruelty* of the operation is in the imagination of the objector. A child erupting its third year molars, having previously been submitted to the operation of the lancet over one or two teeth, and appreciating the relief therefrom, will sometimes come voluntarily to the physician, point out with little finger the next erupting tooth, and stand by his knee while a similar relief is afforded. A little finesse will sometimes enable the physician, having gained the attention of an infant, to lance, one after another, two or four teeth while interesting the child by artful tricks of expression or voice, without a whimper from the victim. The resistance of the cicatricial tissue is a myth. That the operation has sometimes to be repeated applies equally to the failure of a single dose to check a diarrhoea or overcome a constipation.

When either the local appearances, or the systemic condition, or both, suggest the use of the lancet, the one object should be to divide the gum so as to release the advancing tooth. The cuts should therefore be made with special reference to the form of the erupting tooth, and sufficiently deep to reach the presenting surface. The incisors and cuspids need only a division in the line of the arch. The molars require a crucial incision, at once easier of performance, and more effective than a right-angular division—the centre of the crown, as near as can be determined, indicating the point of decussation. The partial eruption of a cuspid or molar does not lessen the pressure upon or by the gum-tissue. The cone shape of the cuspid maintains the pressure by the inclosing ring, which should be severed on the anterior and posterior as well as on the lateral surfaces, if a question as to the relation of its eruption to reflex troubles is to be settled. So also the points or cusps of a molar may have erupted, and yet the

resistance of the gum-tissue remain operative, and require a severance by crucial or circumferential incisions to release it.
Annals of Gynæcology and Pædiatry.

Reports of Societies.

STUDENTS' SOCIETY, NATIONAL DENTAL HOSPITAL, LONDON.

The last Ordinary Meeting of this Society was held on *Friday, April 3rd*, at 8 o'clock, R. DENISON PEDLEY, Esq., *President*, in the chair.

The minutes of the previous meeting were read by the Secretary and confirmed.

The following gentlemen were present as visitors and received the usual form of welcome from the President:-- Messrs. Beverley, Buist, Garrould, Ritchard, Clarence Read, and Stanley Read.

Messrs. C. Bascombe, Burgess, Farmer and Ward, were elected members of the Society.

CASUAL COMMUNICATIONS.

Mr. DUNLOP presented to the Society a lower central incisor which had been very much reduced in size through attrition, the smooth surface extending from the anterior surface at the top of the tooth to the edge of the gum at the posterior surface, there being no crown visible.

Mr. STANLEY READ shewed a portion of a curved elevator which had been broken in endeavouring to extract a right lower wisdom tooth, lying horizontally in the ramus. He removed it after being embedded entirely out of sight between the second and third molars, in which position it had caused intense inflammation. He also shewed two upper models, in one of which there was congenital absence of the lateral incisors, and a supernumerary tooth placed internal to the left canine which had been taken for a badly placed ill-formed lateral.

In the other model a well formed supernumerary tooth, looking something like a central incisor, was placed behind the left central.

A short discussion then took place on the above communications in which the President, Messrs. Humby, Clarke and Stanley Read joined, the chief point of controversy being the elevator, the President finally proposing that members should bring to the next meeting those elevators they themselves preferred, which could then be debated on.

There being no more casual communications, the President called on Mr. Clarence Masters for his Paper on "The more Common Diseases of the Teeth." (See page 385).

The above Paper gave rise to a very long discussion in which the President, Messrs. Humby Clarke, Stanley Read and Clarence Read took part, at the conclusion of which the President thanked Mr. Masters for reading a paper which had given rise to a very interesting debate.

The meeting was then adjourned till Friday, May 8th, when a paper will be read by Mr. Stanley Read on "Fractured Jaw and its Mechanical Treatment from a Dental Point of View."

Dental News.

ROYAL COLLEGE OF SURGEONS, EDINBURGH.

During the April sittings of the Examiners, the following gentlemen passed the First Professional Examination:—Robert Lindsay, Edinburgh; Thomas Nash, Edinburgh; Thomas Evans Johnston, Carnbee, Fife; Alexander Young, Halifax; James Joshua Martin, Bradford; Henry Perkin, Dewsbury; and John Malcolm, Edinburgh; and the following gentlemen passed the final Examination and were admitted L.D.S., Edinburgh:—John Maxwell Wood, Dumfries; Robert Nasmyth Hannah, Edinburgh; Joseph Douglas Stewart Shepherd, Edinburgh; Murray Thomson, Edinburgh; Sewell Simmons, Liverpool; John Alexander White Kirkpatrick, Leith; William Herbert Dennis, London; and John McLaren Mason, Edinburgh.

A DENTIST'S SLANDER CASE.

In the High Court of Justice, on Tuesday, Mr. Justice Vaughan Williams, and a jury, heard the case of Girdler v.

Germer, which was an action by Mr. A. T. Girdler, dentist, of 469, New Cross Road, against Mr. Charles Germer, baker, 41, Jerningham Road, New Cross, for alleged slander. Mr. Cock, Q.C., and Mr. Cecil Chapman appeared for the plaintiff, and Mr. Hansell for the defendant.

Mr. Cock said that prior to August last, Mr. Girdler made a set of teeth for defendant's mother, for which she paid three guineas. They subsequently required some little alteration, which he made, as he (Mr. Cock) understood, to the satisfaction of everybody. Defendant's mother, however, was in a bad state of health, and she got the impression that her ill health was due to the teeth. She consulted a doctor, who told her that there was nothing the matter with the teeth, but that her indisposition was due to other causes. That did not satisfy defendant, who on the evening of August 27th, came to plaintiff's house while he was engaged professionally with a lady, the wife of a medical man. It was on this occasion that the alleged slander took place. On this action being brought the defendant instructed his solicitor to bring a charge against the plaintiff for professional negligence in respect of the teeth supplied to his mother. That action Mr. Germer now abandoned.

Mr. Hansell said defendant had nothing to do with the action, it was his mother's.

Mr. Cock said his client did not wish to make money out of this thing. What he asked was either an expression of regret on the part of defendant, or else such fair and reasonable damages as would enable him to say that when he swore that there was no foundation for the defendant's statement, the jury believed him, and showed their belief by their verdict.

Plaintiff said he had carried on his practice for twenty years. He made the teeth referred to in May, and received no complaint of them. On August 27th, defendant came to his house, giving the name of Smith. Whilst witness was engaged in his operating room, stopping a lady's teeth, defendant came thumping at the door of the room. The noise became worse, and witness opened the door. Defendant said he must see Mr. Girdler, but witness said Mr. Girdler was engaged, and he must see one of the assistants. Witness called one of his assistants to see what defendant wanted, and order him out of the place. After the lady had gone witness asked defendant how he dare interrupt him while he was

engaged professionally. Defendant replied, "You engaged professionally? You were playing about with the woman you had inside." Witness seized the defendant by the coat, banged his head against the wall, and dared him to repeat the remark. (Laughter). Defendant said "Don't hit me," which cooled witness, and he asked defendant what he wanted. Defendant said he wanted a receipt for the three guineas which his mother had paid. Defendant further said, "You are a cheat. You have cheated my poor old mother, and I will show you up in the papers. This remark, like the previous one, was made in the presence of witness and two assistants and his lad. Witness told one of the assistants to prepare a receipt, but, as he was still annoying, witness showed him out. Witness had since found much difference in his business, so far as casual patients were concerned

Mr. Hansell cross-examined the plaintiff with a view to shewing that his practice had not fallen off.

Edward J. Steady, late assistant to plaintiff, and Thomas Conelly, and the lady corroborated, stating that defendant was first seen by the former, who showed him into the waiting room.

Mr. Hansell contended that it was absurd to say that any damage accrued to defendant through whatever was said in the presence only of his employés. Further defendant absolutely denied that he ever used the words complained of.

Defendant said he gave the name of Smith because he thought it would facilitate an interview, his mother and other relatives having been several times before. Witness waited nearly an hour before he knocked at the door of the operating room. He did not use the words ascribed to him. He said to plaintiff that he heard him talking to a lady inside, and he also said, "You ought to be ashamed of yourself treating my old mother as you did."

His lordship told the jury that if they found the words were spoken to the plaintiff as to his conduct in his business room, then it must be taken that special damage was not of the essence of the case.

The jury found for the plaintiff, damages £10, and his lordship gave judgment with costs on that scale.

The following witnesses were in court to give evidence for Mr. Girdler in the action which was discontinued:—Drs. Chas. Glassington, Dental Hospital; Thos. Dutton, Craven

House, Northumberland Avenue ; A. Dunn Turner, Drake and Wiseman, New Cross ; Adams, Greenwich ; and Mr. Wade, Dentist, Sidcup.

VACANCY.

Liverpool Dental Hospital. The post of House Surgeon is vacant. Applications to be forwarded to the Dean, 10 Oxford Street, Liverpool.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

THE ARTIFICIAL TEETH SUPPLY AT THE "LONDON DENTAL HOSPITAL."

To the "Editor of the British Journal of Dental Science."

SIR,—Concerning the matter of the "Dental Hospital" supplying artificial teeth, I should like to mention that in the "Guy's Hospital Gazette" it is stated, that they make teeth for the nurses, and any really poor patients *without any payment*, and that they will not make or supply teeth to the outside poor! This arrangement must, I am sure, commend itself to all dentists as one entirely free from all the objections that can be urged against the system in practice in Leicester Square, and as the London Dental Hospital is in the neighbourhood of two or three large hospitals, there would be no difficulty in finding deserving cases.

If the special Dental Hospitals pursue a policy adverse to the interests of the general body of dentists, they will, I feel sure, "play into the hands" of the large general hospitals now starting dental schools, and likely before long to be very powerful antagonists. Hoping to hear the opinions of some of my brother dentists on this subject.

I remain, Yours faithfully,

April, 1891.

L.D.S., Eng.

ANSWER TO CORRESPONDENT.

C. Audley. Your letter is not suitable for the Journal, it is too personal.

British Journal of Dental Science.

No. 560. LONDON, MAY 15, 1891. VOL. XXXIV.

A CASE OF A TOOTHPLATE IMPACTED IN THE PHARYNX : SEPTIC EMPYEMA AND ULCERATION OF THE DUODENUM : DEATH.*

BY A. PEARCE GOULD, M.S., F.R.C.S.
Senior Assistant Surgeon to the Middlesex Hospital.

IN bringing under the notice of this Society the following case I am well aware that I am repeating an oft-told tale, and one with which all the members of this Society are very familiar. But I venture to do so for two reasons which I hope may be deemed by you sufficient. In the first place, the case baffled me, and, painful as it is to admit, it is yet very necessary that a failure to deal with such an accident as the impaction of a tooth-plate in the pharynx should be recorded. Again, the course of the case was remarkable—quite out of the common—and in the summary of cases of this nature read to this Society by Mr. Felix Weiss fourteen years ago there is no mention of such a sequel as I have to tell to-night. The patient was a married woman forty years of age, of nervous temperament, but enjoying fair general health. For some time she had worn a small vulcanite suction plate bearing two artificial teeth, the right central incisor and the left second bicuspid. Last year she met with an accident, and broke off a part of the plate, and impaired the suction action, and as a consequence the plate was not firmly fixed in her mouth. On January 3rd, 1891, she was cooking potatoes, and tasted one to see if sufficiently boiled ; at that moment she was startled by hearing a knocking at the door, and she immediately felt pain in her throat and difficulty of breathing ; as she put it, she “felt as if she was strangled.” She

* A paper read before the Odontological Society.

tried to vomit, and on putting her hand to her mouth, she discovered that her tooth-plate was gone. Her medical attendant, Dr. Robertson, was sent for, and gave her emetics, which succeeded in making her very sick, but failed to bring away the lost plate. He was also unable to seize it with his œsophagus forceps. On January 8th, I was asked to see her. I found her sitting upright in bed, evidently in great distress, frequently hawking up mucus, only able to swallow liquids, especially hot brandy and water, and pointing to the region of the thyroid cartilage as the seat of her acute pain. I failed to see the plate with the laryngoscope, but owing to the extreme irritability of the pharynx, I was unable to make a satisfactory examination. I could not feel the teeth from the outside. I first passed a common umbrella-probang, but it brought nothing away. Then I passed a coin-catcher, and on withdrawing it, it caught in the edge of the plate, which was found to be lying behind the cricoid cartilage, but I was quite unable to extract it; it was so fixed that it resisted even considerable traction; this I repeated many times. I then resorted to pharyngeal forceps, of which I had several varieties; but although I more than once seized the plate, I could not remove it. All of these attempts on my part were, of course, painful and distressing to the patient, and after I had continued them for more than an hour I felt bound to desist. I then advised that Mrs. T. should be sent into the hospital, and, accordingly, she was admitted into Middlesex Hospital under my care on January 9th. She then stated that since I left her the plate had dropped down her throat, and was lower than before. She lay in bed on her right side, and breathed with some difficulty; her temperature was 99·8°. Within an hour or two of admission she was taken to the theatre, and chloroform was administered by Mr. Fardon, the mouth was opened with a gag, and a forceps applied to the tongue.

A small gum bougie was gently passed down the œsophagus, but the plate was not felt. A whalebone probang with an ivory end, first a large one, then a small one, was also passed, but no plate could be felt. A vertebrate probe gave a similar negative result. I then tried to find the plate with the coin-catcher and the forceps I had used the day before, but could not feel or seize it. As the plate appeared to have passed down I determined to pass a full-sized gum bougie gently on into the stomach if possible; this I did, the instrument pass-

ing seventeen inches from the teeth, *but it was not so free in the gullet as normal*. However, we came to the conclusion that the plate was probably in the stomach, and so resolved to return the patient to bed, to feed her when possible on bulky food, and wait on events. Evening temperature 101·6°.

She passed a restless night, and complained of pain in the right side. However, she took three quarters of a pint of milk through the night, and next day, January 10th, swallowed some rusk soaked in milk without any pain except in the pharynx, which was attributed to the extensive manipulation to which she had been subjected. Temperature morning 99°; evening 101·4°

January 11th.—She had passed a better night, and had taken liquids and soaked rusk fairly well; but she complained much of a tight pain across the lower part of the right chest, especially at the level of the fifth rib within the nipple line. My colleague, Dr. Finlay, saw her with me, and his examination revealed impaired resonance over the lower third of the right back. At the extreme base behind, the breath-sounds were scarcely audible, bronchial in character, and distant; towards the upper limit of the impaired resonance the voice-sounds were of nasal quality. In front the resonance was impaired below the third rib. The heart's impulse was best felt just inside left nipple line; it was accompanied by a thrill, and there was a rough præ systolic and a short blowing systolic murmur audible at the apex. Pleuritic effusion was diagnosed. She was ordered oatmeal porridge, arrowroot, and a little suet pudding, which she took. In the afternoon her breathing became very painful, and still worse in the evening; a morphia injection was given. At 11 p.m., the pain still being severe, I ordered two leeches to be applied to the chest, which gave great relief, and then after another morphia injection she had a good night, and took three-quarters of a pint of milk. Temperature, morning 100·4°; evening 102°.

January 12th.—This morning she took a cupful of porridge. Dr. Finlay again examined her chest and found the dulness more intense, but not increased in area, and the heart no further displaced. Temperature, morning 101·4°; evening, 101·8°.

January 13th.—Patient had not a good night owing to pain in the right side, getting only fitful sleep after a morphia injection. She took tea and milk through the night, and ate

porridge for breakfast and some tapioca pudding for dinner. She is now free from pain along the alimentary tract, and swallows easily. Her bowels not having acted since admission, an enema was given, which brought away a small motion. The patient was sick twice on this day. Temperature, morning $100\cdot28^{\circ}$; evening $99\cdot6^{\circ}$. She again passed a very restless night, being in great pain, and feeling sick, the next day (January 14th) her pulse was rapid and soft, and she was obviously less well. Urine 1020 acid, containing a trace of albumen. Nutrient enemata were ordered, and injections of morphia, gr. $\frac{1}{3}$ as required. Temperature, morning 99° ; evening, 101° . Again she passed a restless painful night. About 1 p.m. on January 15th, she was seized with most intense pains in her right hypochondrium—lower than before—so intense was the pain that it rendered her almost uncontrollable; it was only gradually overcome by morphia. To-day her breath was noticed to be sweet. Temperature $100\cdot4^{\circ}$.

January 16th.—Patient in a clammy sweat, unconscious, with hurried breathing, very rapid running pulse; the urine contained $\frac{1}{5}$ volume of albumen. The temperature gradually fell, and at 6.30 p.m. she died. The medicinal treatment adopted consisted of three things—morphia, to relieve the severe pain; quinine, to combat the septicæmia, and brandy as a stimulant when the heart's action began to fail.

The *post-mortem* examination was made by Dr. Sidney Martin, and the following is from his report:—

“*Pharynx and Œsophagus* removed together. On opening these a composition plate with two artificial teeth attached, is found impacted in the left wall of pharynx, near junction with Œsophagus. One tooth is right through the wall, lying in abscess cavity presently to be described. The plate lies with its concave surface on the back of the larynx (arytenoid and cricoid cartilages), the teeth attached being just at level of commencement of ary-epiglottidean folds. Beneath the plate, mucous membrane of pharynx shown one or two recent ulcers. Where the tooth and plate have perforated pharynx the wall is gangrenous, shewing ragged ulceration, and the tooth lies outside in a small abscess cavity containing offensive pus. This abscess cavity extends downwards by a long sinuous track of suppuration (not more than a $\frac{1}{4}$ — $\frac{1}{2}$ in. wide) along the left side of Œsophagus, passing behind aorta on into posterior mediastinum, where it deflects to the right and

opens about the middle of the thorax into the right pleural cavity by an aperture about two lines in diameter.

“*The Right Pleura* contains about 90 oz. of thin and very offensive pus, with three yellow oval masses size of a bean, which look like yolk of egg inspissated (? food). The pleura is covered with recent lymph and the lung is collapsed and completely airless.

“On lifting up the liver, the *duodenum* tears away from a recent attachment to it on the left lobe, the surface of the liver being gangrenous over an area $1\frac{1}{2}$ in. across and $\frac{1}{4}$ in. deep. The duodenum attached to the liver is completely perforated by a circular ulcer $1\frac{1}{2}$ in. in diameter. On opening the gut the ulcer is seen to be a clean perforation through walls, no thickening or bevelling of edges. Near it is a slightly smaller acute erosion of mucous membrane and below it are two similar erosions transverse in direction, about $\frac{1}{4}$ in. long by $\frac{1}{8}$ in. broad.”

With the exception of “cloudy swelling” of the heart and kidneys the rest of the viscera were found normal.

Remarks.—In commenting on this unfortunate case, I think it will be best to trace the events in the order of their occurrence. And, first of all, we had here the fact so common, so often repeated in the histories of these cases—an insecure tooth-plate—insecure from no fault of the dentist, but from an accident to the plate which the patient was not sufficiently alive to the importance of and took no steps to have remedied. The displacement of this plate was caused by a sudden incautious act of deglutition, and in this detail, too, the case is parallel to very many of the series to which it belongs.

The plate was evidently impacted at first in the lower part of the pharynx, behind the cricoid cartilage—the most likely place of all for a large and irregular substance to be arrested in its passage towards the stomach—and here it gave rise to the usual distressing symptoms, not only of pain and dysphagia, but of cough, dyspnoea and a sense of choking. An attempt was made to remove it, with the finger, ordinary forceps, and also by exciting emesis, but it failed. And now an interval of six days elapsed before any further attempt was made. It is only right to say that the doctor in charge of the case was in no way responsible for this, and that it was owing to the extreme reluctance of the patient and her husband to have further advice that so long a time slipped by

before I was asked to see the case. This was the cardinal fault in the treatment. All during those six days the sharp points of the teeth and plate were not only pressing against the delicate mucous membrane, but with each effort of deglutition the constrictor muscles contracted on the plate and forced these sharp points deeper and deeper in. It is worthy of note that this ill effect of muscular contraction is more marked in the pharynx than in the gullet, as the constrictors are more powerful than the muscular coat of the œsophagus.

From this ulceration of the pharynx two ill results followed. On the one hand a tooth passed into the ulcer, and so fixed the plate that when I seized it in the forceps and caught it in the coin-catcher I found it impossible to extricate it, even when some amount of force was employed. And, indeed, it is to be feared that my very efforts at extraction only served to bury the tooth deeper and deeper in the tissue outside the pharynx. On the other hand, the ulceration of the pharynx was the starting point of a septic suppuration outside the gullet, which by direct extension led to the septic empyema, and also to more remote septic changes—ulceration of the duodenum.

The next important fact in the case was my failing to find so large a foreign body in the pharynx, and that only twenty-four hours after having it repeatedly in my forceps. Had I missed it on both occasions it might have been not unreasonably attributed to my want of skill, but this cannot be the sole explanation when the same hand and the same instruments catch the plate on a Thursday afternoon and altogether miss it on the Friday afternoon following. I wish, therefore, to lay stress upon the fact, for it is of great importance, and the knowledge that so large a body may be overlooked ought to make the surgeon particularly cautious in deciding upon the absence of a supposed foreign body. Of course, my experience is not unique; you all know Sir James Paget's famous case where he found a set of teeth in the pharynx of a patient brought up to him on the supposition that he was suffering from malignant stricture of the gullet. No doubt in this room are those who can bring forward other similar cases. But the explanation of my failure, is, I think, very interesting. My opinion is that in the interval between my two attempts, the plate shifted its position a little, and in its new place fitted accurately over the back of the cricoid cartilage, so that it scarcely projected into the pharynx at all, and

that then the swelling of the mucous membrane around it covered in the edges of the plate and caused even a coin-catcher to pass over it without detecting it. And I suspect that this change of position was in part due to the progressive ulceration of the tube which allowed the tooth to pass so far out that the plate fell into this unfortunate position. The evidence in favour of these assumptions is first that at the autopsy the plate was actually in this position. Secondly, that the patient herself believed the plate had moved and had "gone down." Thirdly, that her powers of swallowing were much better after she came to the hospital than before she left home.

The pathological changes in this case are noteworthy. I have been unable to find in any of the books I have read another case quite like it. There are, of course, many recorded instances of ulceration of the pharynx and gullet, and in not a few perforation of an artery or vein has led to fatal hæmorrhage. Similarly, a pleura or the pericardium or the trachea has been pierced by a foreign body forced through the œsophagus, and in other cases peri-pharyngeal suppuration leading to the formation of extensive abscess in the neck has occurred. But in my case we had merely a long sinuous line of suppuration—no abscess—a line which progressed, however, with fatal precision until it infected the right pleura. The septic ulceration of the duodenum is a rare phenomenon, and is akin to that occasionally occurring in burns. The symptoms of this fatal malady were also rather marked: there was fever—but not high, no rigors, no swelling in the neck—nothing, in fact, to direct our attention to what was actually going on. We knew she had pleurisy, and I feared that I might have pushed the plate through the gullet into the right pleura in my attempts to pass the bougie.

One other remark is called for. I think it probable that at the time this poor woman came into the hospital the fatal process was already so far advanced that mere removal of the tooth-plate would have been a barren triumph, and that I should still have had to record her death from septicæmia. Of this I cannot be certain, but the speedy onset of the pleurisy, and the undoubted existence of the pharyngeal ulcerations for a day or perhaps longer before that incline me strongly to that view.

I would bring these remarks to a close, with a few deductions not grounded only on this case.

1. That any but a very securely fixed tooth-plate is a grave source of danger to a patient. Adelmann tells us that 35 per cent. of cases of impaction of a tooth-plate have proved fatal to life.

2. That when a tooth-plate is impacted there should be no unnecessary delay in its extraction. That they are never innocuous, and that absence of pain and of other symptoms is no sign that grave mischief is not being wrought.

3. That as a tooth-plate in the pharynx may be overlooked, the most scrupulous care should be taken by the surgeon to assure himself of the actual state of affairs.

NOTES ON THE TREATMENT OF PULPLESS TEETH WITH ARSENIOS ACID.

BY M. H. FLETCHER, M.D., D.D.S., Cincinnati, Ohio.

THE late experiments of Professor Miller seem to have put us in the way of pulpless teeth more intelligently, for the reason that we now have some facts as to what kind of germs we are dealing with. We do not question that they have already been successfully treated by the intelligent practitioner, yet we have not been treating these conditions with a specific idea of the kind of life we are trying to destroy. I venture to suggest a plan (not entirely new) by which both patient and operator may be saved time and annoyance. The theory is first that gas forming bacteria must be gotten rid of before these cases can be successfully disposed of, and that this condition can most quickly and conveniently be accomplished by the use of arsenious acid or other strong germicides. I first venture the statement, that there is no lesion of the tissues of the body (not self-limited) more amenable to treatment than the one in question. This is proven by the many and various kinds of treatment suggested and practised. Many operators go so far as to say that they "never lose a case." While they believe this to be true, it is probably safer to say their loss is exceedingly small. Now if it be so simple a process to treat these cases successfully, it should also be a short process.

Dr. George Cunningham, of Cambridge, England, gave

three years ago a paper and statistics on the treatment of such teeth with arsenious acid. He says of their curability, "The success of the operations seem mainly to depend on the old axiom, 'the cause being removed, the effect ceases.' No observant operator can have failed to notice the inherent curability of abscessed teeth. Who has not noticed the frequency of cicatricial tissue marking the existence of former fistulous tracts, even where the putrefactive contents had been allowed to remain? It is to this inherent property of spontaneous curability that we look for the relief and cure of all the injurious conditions arising from a putrescently diseased pulp." Dr. Cunningham designates the arsenical treatment as the "immediate method," and the other and longer processes he calls the "dressing method."

We do not claim originalty in what we wish to present, except possibly the formula used, and the manner of its use. Dr. Cunningham gives the following :

R—Arsenious acid, gr. ii ;

Alcohol, fʒi ;

Oil of Cloves, fʒi.

He reports a loss of only three teeth out of five hundred and twelve treated. Our own formula is :

R—Arsenious acid, gr. ii ;

Precipitated chalk, ʒi.

Add glycerine to make a thick paste.

(Arsenious acid is only slightly soluble in water, one part dissolving in about fifty of water, and slightly more soluble in glycerine, so that only small portions of arsenic would be carried to the pulp chamber. No chemical union results from the mixture of arsenic with the chalk.)

The latter formula I consider better, because it is more easily manipulated, and, in consequence, is less dangerous to surrounding tissue ; 1, because the quantity is small by its admixture with chalk ; 2, because the quantity is easily measured by the eye, and being in a semi-solid form, it is not likely to be forced through the apical foramen as a fluid might, while yet there is present an ample quantity to be a thorough germicide. The dose of arsenic is from one twentieth to one-fortieth of a grain ; the stomach of an adult readily takes up this quantity. But in its use as we recommend there is probably not more than one-fortieth of a grain applied in any case, and this not in contact with soft tissue at any place unless it be forced through the foramen ; and

should this occur, and there be a pus-sac, the one-thirtieth or one-fortieth of a grain of arsenic would most probably be good treatment for it, acting upon the pus and destroying bacteria, and having done its work would become absorbed by the blood-vessels with no destructive effect upon the tissues.

It may be used as follows : Take of the arsenical compound about half a grain, a portion about equal in size to a half grain of wheat, place this upon a glass slab and mix with it a drop of water from the end of the finger ; then with a nerve-broach covered with cotton mix the two thoroughly. This is introduced into the pulp-canal, which has been previously cleansed, dried, and washed with alcohol, being careful to get the canal thoroughly filled. Then dry out again, and, in the majority of cases, fill immediately both roots and crown with any material desired. Teeth with small and tortuous root-canals, into which it is difficult to explore or force a fluid, are probably better left with the dressing in for a few days.

My statistics (one hundred and forty-eight cases in the past eighteen months treated after this matter) show only two cases from which the dressing had to be removed to give relief from pain.

Another advantage in the use of the arsenic in this form is that small particles of the salt are carried with the solution into the root-canal and remain there. The continual presence of such a germicide in the pulp-chamber and canal is perfectly legitimate, since the canal is in no way connected with the circulation after the death of the pulp, and has no connection with the cementum which will allow the passage of any destructive agent.

These canals, if neither filled nor sterilized, would most likely cause trouble sooner or later. According to Dr. Cunningham, they may be safely left without filling if kept thoroughly antiseptic. The plan adopted by him was to cleanse the pulp-chamber and larger root canals, then cover one side of a piece of paper with his arsenical compound and put it into the pulp-chamber with the arsenic side toward the canals, then proceed to fill upon this with a cement, finishing with any other material desired.

The plan of using cotton saturated with carbolic acid and other antiseptics and filling over them is one of the oldest of the many methods ; but have we not all been obliged to remove many such dressings after they have had time to become

useless as antiseptics? The list of agents and plans for dressing root canals is too long to give now: but according to our experience nothing so completely fills the requirements in every particular as arsenious acid. Fowler's solution might be used, but its strength is not always certain, and there is no crystal of the salt left in the canal to keep it antiseptic. We have also tried a solution of bichloride of mercury, and even with a 1 to 1000 solution trouble ensued. The powdered bichloride might be used in the same manner as the arsenic, but it is so much more soluble in water and so dangerous to tissues that it is less desirable.

According to Professor Miller, some very active agent must be used to sterilize a pulp-chamber. On page 97 of his late work on micro-organisms he says, "Attention has already been called to the fact that the dental pulp presents in a high degree the conditions essential to the formation of spores, and since spores possess high powers of resistance, the antiseptic treatment of root-canals is thereby rendered more difficult."

The necessity of destroying these germs is clearly set forth in the same work, page 111, where he says, "I would call especial attention to five different gas-forming bacteria, which invariably form large gas-bubbles in the gelatine, or tear it to pieces, as represented in the figure. One of the bacteria, which generates considerable quantities of gas in albuminous substances, I found in the human faces as well as in a gangrenous tooth-pulp. Its appearance in the latter place may help to explain the frequent occurrence of dental abscesses. If a tooth be filled before removing the necrotic pulp and sterilizing the root-canals, the gas formed will force itself through the foramen in the apex of the root, or carry particles of the putrid pulp along with it, causing irritation, if not immediate inflammation, of the pericementum."

Thus it would seem, not only from recent investigations, but from the past experience of most practitioners, that the agents used have been such as would destroy organisms and spores, whether they were used with this idea or not. But in many cases the teeth were kept sore for weeks, and sometimes for months, by the frequent introduction of steel points or medicaments, each time introducing a few more bacteria, while explaining to the suffering patient that the case was a most difficult one to cure. On the other hand, the rational treatment would seem to be that of removing the exciting

cause by thoroughly sterilizing the pulp-chamber and canal in the shortest possible time. Exciting causes may be foreign bodies, either fluids, solids, or gases, all of which are accompanied with bacteria. Once these influences are removed, the spontaneity of tissue is such that it will soon return to its normal condition. If the idea of the natural tendency of tissue to return to its original state can be thoroughly instilled into our minds, and also that we are simply to allow the living tissue to do what it is continually trying to do, then the treatment of abnormal conditions is greatly simplified. Time will be saved to patient and operator, and we will soon find ourselves in touch with nature, which means immediate success in many cases where we now have much trouble.

Keeping in mind the old axiom, that "the cause removed, the effect ceases," our trouble in the treatment of pulpless teeth is reduced to a minimum, and our patients saved both time and annoyance.

MANIPULATING OXYPHOSPHATE

In making oxyphosphate fillings, some manipulate it too much especially, by working it in the fingers after it has been mixed on the slab. Neither should it be mixed very stiffly. If it is mixed quickly and left a little sticky then pressed immediately into the cavity and shaped as a finished filling without after-disturbance, it will become very hard and glossy and will adhere to the walls of the cavity. This adherence can be increased by rubbing the walls of the cavity, before inserting the filling, with a pledget of cotton slightly moistened with the acid. The surface should not be smoothed while soft by a cloth or strip, nor by an instrument while it is hardening, nor by a file after it has hardened; all the shaping, smoothing and finishing should be done quickly by a thin burnisher, slightly covered with oil. As soon as this is done and the gloss comes on the surface, cover it with a coating of chloro-percha. When this is dry, cut away the dam, and not draw it over the chloro-percha.

(Items of Interest).

British Journal of Dental Science.

LONDON, MAY 15th, 1891.

THE DRONES OF THE PROFESSION.

To those whose duty it is to keep constantly in touch with current dental Journalism, not only of this country but of other lands, there is one fact in connection with it which stands out very prominently ; it is the paucity of writers on subjects connected with our art and science. It is of quite secondary importance which country may be selected to test the truth of this statement, for all prove it equally well. Over and over again the same author will be found writing now on this subject, now on that ; indeed, were it not for these few men Dental Journalism would, as far as original articles are concerned, come practically to a standstill. Now we can quite understand that a man might not care to be always writing, indeed, in a certain sense, it is not desirable ; but at the same time it is surely not a little curious that, with some four thousand eight hundred dentists in Great Britain alone, a greater number should not have something to say, or should not take the trouble to say it. It is not as if the members of the Profession did not trouble about its Journals, we have sufficient evidence that they do, but somehow they do not seem to be alive to the benefits they would render, not only to their professional brethren, but also to themselves, by participating actively in their elaboration.

In thinking over why this state of things should exist, several causes suggest themselves to one's mind as having, possibly, some share in bringing it about. Of these, the one

which seems to us to probably carry the greatest weight is that men do not care to write about what seems to them trivial matters. They say:—"We would willingly write if we had something to write about, but it is all so old, it has been so often dealt with, and if the idea may be new to me, it is probably stale enough to other folks." It is the old tale over again. Who has not heard of the boy artist who found in a piece of chalk and a stable door materials for the exercise of his talent, and in his everyday surroundings subjects worthy of his work? Who does not know of the child musician who found in his mother's pots and pans, instruments on which he could pour forth his melody." Just as the mechanical painter travels the world o'er in search of "subjects" and finds naught; as the automatic musician finds all instruments more or less out of tune; so do these dentists search in vain for aught to write about. That is a very true saying: "There are none so blind as those who will not see," for subjects there are, subjects galore, if men would but take the trouble to look under their very noses. But whether or no men will, or will not, write articles, there are yet many ways in which they can take a hand in making the Journals more interesting and more profitable. We need only mention the correspondence columns; records of cases, mere recital of observed facts, and so on.

We said just now that the paucity of writers was apparent to journalists, but it is a curious fact that it is noticed and commented on by the very men who never take pen in hand, by the drones of dentistry, as one might almost call them. And it is also worthy of note that they are very apt to criticise, not altogether kindly, the work and writings of the few on whose shoulders the heat and burden of the day fall. There is something very attractive about a man who from an arm-chair in an office directs a big organisation, whose brain is the mainspring of the whole, but there is something equally unattractive about the arm-chair politician, the arm-chair critic, who at his comfort and his ease passes away his hours in snarling at other folks; who finds in efforts for the

amelioration of the lot of his less fortunate fellow men, men who haven't arm-chairs, nothing but the work of unprincipled agitators ; who finds nothing but imperfections in the writings, and doings of those who write and do. Poor man ! were it not waste of time to pity such, one would almost try to pity him. If roused, by some unaccountable impulse, to put pen to paper, does he attempt to write aught that is of interest or of use ? Not at all, he merely writes to grumble that other people do not write matter more suited to his sensitive palate ; that they do not labour for his delectation. Now we know very well there are many men with large practices who find but little time for work other than their daily round, we admit that in the face of it the excuse seems valid, but it really is not so. All will admit in theory, whatever they may practise, that it is the duty of a good citizen to care for the commonwealth. It is equally the duty of a true professional man to care for his Profession. It is the duty of a professional Dental-Surgeon to help on the Dental Profession. Not a passive, apathetic sympathizing, but an active, energetic doing, and this at personal inconvenience, even may be at some loss.

There are a good many things which tend to make operations memorable, and certainly none more so than the patient having passed his hundredth year. Such a centenarian was operated on last year in the York County Hospital, by Mr. W. H. Jalland, who supplied the following notes of the case to the *British Medical Journal*:--J. L., aged 102, was admitted on October 18th, 1890, with a small growth springing from the centre of the lower lip, apparently from the junction of the skin and mucous membrane ; it was raised and ulcerated, the edges were coated and hard, and the surrounding skin infiltrated ; there had been no pain except for a week before admission. He said that it had existed for eight weeks, but could assign no cause for it, except possibly a cut whilst shaving. A gland below the jaw on the left side was

slightly enlarged. He had previously been very healthy all his life, not having had three weeks in bed during the whole of it, until last year, when he had "two or three strokes;" he lost his speech in one of these (in April, 1890) for some days. He had never smoked or taken spirits, in fact he says he has never taken any alcohol.

All his senses were clear, except that he was rather deaf, but not extremely so. His memory was good, speech perfect, sight fair. His weight was 8 stone without his clothes; his height was 5 feet 2 inches when erect, but he usually stooped, so much as to take off nearly nine inches of this; there was no indication of any atheromatous change either in the radial or temporal arteries.

On October 21st I removed the growth by a V-shaped incision, and united the edges of the wound by two hair-lip pins. No anæsthetic was used, the patient being given half an ounce of brandy before the operation; he hardly winced during it and did not make any signs of pain. There was hardly any blood lost and no vessel tied. On the third day after operation the pins were removed. The wound healed well; it ulcerated for some four or five days longer opposite the incision, but finally healed completely. The patient was never in bed during his stay in the hospital, except at night. The day following the removal he remarked that it felt more comfortable than before operation."

MOST of our Colonies have now Dental Acts which serve the two-fold purpose of protecting the public and guarding the Profession. There are, however, exceptions, and amongst these is Queensland. We are glad to note that the Pharmaceutical Journal, which is the official organ of the Dental Association of Victoria is calling the dental practitioners of Brisbane to agitate for the passing of an Act. The more so as abuses seem especially rife in that city. We would add

our voice to the cry and would urge that no undue respect for vested interests should allow any laxity in the stringency of its provisions. Our own Act, as has been so often said, erred in creating vested interests by, as it were, hall-marking all and sundry who could by any stretch of the imagination be brought in touch with the practice of Dentistry.

IN an article on "The relations of Medicine and Music," published in the *Medical Bulletin*, Dr. Ephraim Cutter makes one reference to the influence of artificial dentures on the voice. Speaking about those causes which have a detrimental effect, he says :—"Among reflex causes, I would suggest bad teeth—and false teeth with a rubber basis. I have seen such good results follow from the use of dentures where the teeth and plates are of the same mineral material as invented by Dr. W. E. Dunn, of New York, that I recommend them to those who have trouble with artificial teeth, and who professionally use the voice. Cases have been known to sing with these dentures who could not with the celluloid and other plates." This is not only an interesting, but an important point to determine. One cannot see, provided the plates are of equal thickness, in what a porcelain plate is more like the normal palate than a vulcanite one. These are, however, just the points in which a little observation is worth a whole heap of speculation, and moreover a good deal of evidence is needed before anything really definite can be held proven. In the daily routine of practice there may not be much time for much original work and thought, but here are points of great importance, which a man must settle for himself, if he would do justice to his patients. We only ask him to make his conclusions public, that others may examine them and benefit thereby.

Abstracts of British & Foreign Journals.

NOTES ON A SUCCESSFUL CASE OF ŒSOPHAGOTOMY FOR REMOVAL OF A TOOTH-PLATE IMPACTED IN THE ŒSOPHAGUS FOR FIVE YEARS AND NINE MONTHS.

By WILLOUGHBY FURNER, F.R.C.S.,
Surgeon to the Sussex County Hospital.

The longest period of impaction of a foreign body in the œsophagus removed successfully by operation which I can find recorded is three years and a half: the patient was a child; the foreign body a halfpenny. The case is recorded by Mr. Bennett May. In the woman whose case I relate now the foreign body was a silver-gilt tooth-plate with three gold hooks, and carrying three teeth, and had been swallowed five years and nine months before the date of operation.

E. B——, aged forty-four, married, mother of a family, was admitted for the first time into the Sussex County Hospital on Nov. 6th, 1889. She complained of difficulty in swallowing, was thin, but fairly nourished. She said that on the morning of May 4th, 1884, whilst suckling her infant, and turning in bed, a tooth-plate slipped from its position in the upper jaw to the back of the throat; she felt almost suffocated, and being unable to seize the plate pushed it down her throat. Afterwards she experienced difficulty in swallowing and could only take liquid food, occasionally thickened with minced meat or bread crumbs. The dysphagia varied, but was always present and had much increased lately. She referred the seat of obstruction to a point about an inch and a half below the episternal notch. There had been occasional dyspnoea, lasting only for short periods, a minute or two. She was quite sure of the date of the accident, as she was at the time suckling her youngest child. A probang passed down the œsophagus met with obstruction ten inches and a half from the teeth; a coin-catcher got hold, but traction only seemed to tilt the plate into the surrounding tissues. One pair of long œsophageal forceps gripped the body firmly, but slipped off,

and no fresh hold could be obtained. Further measures were then proposed, but the patient wished to return home.

She was readmitted on Jan. 30th, 1890. On Feb. 17th, under chloroform, œsophagotomy was performed. The usual incision was made, about three inches in length, along the anterior border of the left sterno-mastoid muscle. The omohyoid muscle was divided. The carotid sheath having been drawn outwards and the trachea and thyroid gland in the opposite direction, the œsophagus with the recurrent laryngeal nerve on its surface was then exposed; a full sized bougie was now passed through the mouth down to the obstruction, and the œsophagus opened on its posterior surface. On passing the finger into the wound the foreign body could just be reached lying somewhat obliquely to the canal of the tube, the upper part projecting into the canal, the rest of the plate lying in a sac to the right of the gullet. The irregular surface of the plate was so closely surrounded by the walls of the sac that great difficulty was met with in its extraction. Various forceps were tried, but slipped off. It was finally grasped by a straight strong pair, and by a combined movement of pulling and rotation, requiring considerable force, it was at last removed. About an ounce of bright arterial blood followed the removal of the plate. The wound was well washed with weak carbolic lotion. One small artery to the sterno-mastoid required ligature; the œsophagus was not sutured. The upper two-thirds of the external wound were closed, the lower one-third left open, and a drainage-tube reaching up to the œsophagus was fixed in the lowest part of the external incision.

There was only slight shock, but no vomiting, after the operation. The wound was frequently syringed with boric acid solution (ten grains to an ounce of water), some of which the patient was directed to swallow occasionally; the teeth and gums were also cleansed with the same solution. No nourishment was given by the mouth during the first two days, but four ounces of pancreatised beef-tea were administered per rectum every four hours. In spite of all the wound became offensive, the saliva flowing from it copiously. On the third day, as the wound showed no sign of repair and the patient was losing ground, an attempt was made to introduce food into the stomach through a No. 8 gum elastic catheter passed from the mouth. The mere passage of the instrument down the œsophagus produced retching, and

although only about an ounce of milk had passed into the stomach, it all returned through the wound. No further attempt was then made to feed through the mouth until the morning of the fifth day from the time of operation. A small soft catheter was then passed through the mouth into the gullet beyond the wound, but not into the stomach. A little cold milk was then allowed to trickle by degrees through the catheter, but it all regurgitated through the wound. The presence of the catheter in the œsophagus, so long unused to solids, seemed to produce spasm. During the day the patient became much feebler, and very restless, and complained of great hunger. The wound was now covered with greyish exudation, and the whole side of the neck down to the clavicle in front, and to the level of the spine of the scapula behind, was red and puffy. It was determined to make another attempt to get food into the stomach, and on the evening of the same day, the fifth from the operation, the patient was raised and supported in bed, and leaning slightly forward was given some milk to swallow in the natural way. She drank ravenously ten ounces of milk, only about a teaspoonful coming through the wound, which was then syringed out in the sitting posture. From that time she began to recover. She took her food, consisting of milk only, or with an egg and brandy, always in the sitting position. The wound soon discharged copiously, and the redness and puffiness of the neck gradually subsided. On the twenty-first day from the operation she swallowed bread-and-milk; on the twenty-fourth day she took fish; on the twenty-eighth day the wound was healed. The patient was discharged well a few days later with no alteration of the voice. When seen some time afterwards she was stout and well, and could take food without any trouble.

Remarks.—Out of just 100 cases recorded, including my own, I find twenty-three deaths. In nearly all the fatal result was due to exhaustion and cellulitis of the neck. The two most important questions, therefore, in the after treatment of these cases are feeding the patient and keeping the wound clean. There are many different opinions as to the best means of feeding the patient. Barton and Markoe are in favour of feeding through a tube introduced into the œsophagus through the wound. The more so if the œsophagus be incised on its posterior surface, which may be regarded as the seat of election if the position of the recurrent laryn-

geal nerve be considered. Southam, in his two successful cases, fed by enemata for the first fourteen days, and subsequently by a soft tube introduced through the mouth. I tried this in my own case and failed. Abbe approves of closing the œsophageal wound and advocates feeding through a tube protruding from the mouth from the first. Lediard allowed rectal alimentation for the first three days, and then fluids by the mouth. Dr. Geo. Fischer says every patient whether the œsophagus has been closed or not, may be allowed to swallow fluid diet a few hours after operation without the aid of the stomach-tube. So far as the experience of a single case may justify an opinion, I would advise that the patient be fed by peptonised beef-tea enemata, with or without brandy, for the first twenty-four hours or less until the risk of vomiting from the anæsthetic has subsided, and then be allowed to swallow milk. If the incision be made in the posterior portion of the œsophagus, and the patient drinks in a sitting position, very little escapes by the wound, even if the edges of the gullet have not been sutured; no irritation seems to be produced, but vomiting and retching are most injurious. The wound may be syringed out with a weak solution of carbolic acid (1 in forty) whilst the patient is sitting up, if the œsophagus has been incised posteriorly, without any harm resulting. In my case strong boric acid solutions failed to keep the wound sweet. The carbolic lotion was much more effectual. Two teeth have been broken away; one probably when the first attempt at extraction was made with the œsophageal forceps, the other at the time of the operation.

Lancet.

WHY COPPER AMALGAM SOMETIMES WASTES IN THE MOUTH.

By W. B. AMES, D.D.S., Chicago.

Inasmuch as many of us have for several years been endeavouring to attain to some definite knowledge of the physical properties and peculiarities of amalgamated copper,

and as my convictions, derived from an experience of ten years in the use, and four years in the manufacture of the material, are somewhat at variance with those of some gentlemen who have written and spoken on the subject, I have concluded to bring it before this society for consideration.

The most serious short-coming that has been argued against copper amalgam as an offset to its many valuable characteristics, is the tendency in many cases to waste or cup out, and this has seemed to many to be a sufficiently serious objection to cause its abandonment, or to make it necessary to first make a test filling to discover whether the use of this material was warranted in the mouth of the patient in hand. My faith in the material has never been shattered, for the reason that although some of my most conscientious efforts in the making and use of it have resulted in more or less dismal failure, I have had the conviction that the difficulty was to be attributed to the faulty processes and methods of making and using, rather than to inseparable peculiarities. This conviction was supported by having used some time since a quantity of copper amalgam called Sullivan's, made for the Dental Manufacturing Co., London, which differs materially from the "Sullivan's" furnished by Ash & Sons. This amalgam I found to stand in mouths in which all other preparations of the kind would waste to a greater or less extent, and furnished me the incentive to labour toward the cause of the lack of stability of other copper amalgams. That the wasting was most serious in what is termed acid mouths, was not a very tangible clue to start upon, yet it was most natural to consider first what solvents of the constituents of copper amalgam we might naturally have within the mouth. It would be unreasonable to suppose that there was ever a condition of the saliva sufficiently acid to dissolve copper and mercury to the extent that we often see, unless the action was in some way intensified, as these metals are only soluble in nitric acid and the more powerful nitro-muriatic, unless the less energetic acids be used in connection with a galvanic couplet, *i.e.*, as the fluid of a battery of which one of these metals is the positive element, or as the electrolyte with one of the metals in question as the anode. In the case of copper there might be a very slight wasting from oxidation and sulphuretting of the surface; these compounds being either dissolved or worn from the surface so that there might be a continuous reformation, but in the case of the mercury which is the metal which is supposed to be presented

upon the surface there could be no such wasting, as it does not oxidize under the conditions present and the sulphuret which is the compound formed in the cold state, would be a very tenacious and insoluble film. The black film which the fillings take on which do not show any evidence of wasting is undoubtedly the black sulphuret of mercury—that being the compound that is formed when mercury and sulphur are brought together in the cold state.

The only tangible clue to the solution of copper amalgam in the mouth seemed to be the fact that out of the mouth the galvanic current would cause the solution of its components in the weak acids and the phenomena observed in the mouth, in the more rapid wasting of those fillings which were so placed as to form the positive element of a battery, the negative element of which was an adjoining or occluding gold filling or crown.

Starting with this as a clue, it was natural to take notice of the fact that many of the copper amalgams when made at all dry, presented the appearance of being composed of copper amalgam and free copper, the surface showing in some specimens almost a copper colour, and it was most natural to question whether or not this free copper was the positive element and the amalgamated portion the negative element of galvanic battery when placed in the fluids of some months. This would readily account for the entire phenomena, for it would be analogous to the solution of impure, unamalgamated zinc with an amalgamated surface is not dissolved. Upon treating with a solution of mercurous nitrate, amalgams, containing free copper, it was found that the nature of the material was radically changed, a much more thorough amalgamation being brought about, and with it, much better results being obtained in the mouth.

Now what is the cause of this free copper in copper amalgam? With that of my own manufacture it is largely due to an extensive grinding of the amalgamated copper crystals in a mill devised for the purpose, with a view to giving it smoothness and a more desirable plasticity. It has been the general opinion, I think, that copper amalgam could not be triturated too extensively by the manufacturer or by the dentist at the time of using. In several published descriptions of methods of producing the material, great stress has been placed on the heating and rubbing down and repeating this until sufficient mercury had been worked out and

smoothness obtained. On account of results observed in using amalgam made by myself by a large variety of processes, I decided some time since that all or any grinding was bad for the material, and that the only heat that it should have was that given to it by the dentist at the time of its preparation for the filling. When the amalgamation of the copper is obtained by precipitating it upon the surface of a mass of mercury by the use of electricity, as I originally made the material, the first crystallization takes place with a large surplus of mercury so that heat is absolutely necessary to put it in a marketable condition, and unless the copper has been precipitated in a uniformly fine state, the grinding must be resorted to, whereas, if the copper is precipitated upon some other than a mercury surface and the amalgamation of a proper quantity effected by the use of proper chemicals, the excess of mercury can be worked out and the material put into marketable condition without heat and without grinding. That heating, and especially repeated heating, is bad for copper amalgam where the very best results are required, is unquestionable, as the 250 degrees F. that is required to break up the crystals and set mercury free, is sufficient to volatilize the mercury to a very appreciable extent, as can be seen by holding a piece of gold over the amalgam during the process. While I do not consider careful heating to be as injurious as the extensive trituration that has been so generally advised, I think that it is well to use only fresh amalgam in such cases as we have reason to fear that wasting might take place.

With copper amalgam in which the copper precipitate has been carefully amalgamated, and amalgamation has not been disturbed by heat or grinding, we have a material that will have permanence and stability in the most acid mouth.

Where a filling has wasted, it has in nearly all cases a surface to which fresh amalgam will readily attach, so that these fillings can be easily flushed out, and if this is done with an amalgam that has the proper stability, the filling is practically as good as if the wasting had not taken place.

Dental Review.

DISINFECTION OF DEAD DENTINE.

By Dr. A. W. HARLAN.

For many years the preliminary steps in the disinfection of dentine in pulpless teeth by the use of medicinal agents was one of routine, seldom varying from the soaking of the pulp canal with wood creosote, carbolic acid or combinations of the above with iodine or solutions of zinc chloride. The only theory in support of this practice was that the agent or agents used were antiseptic, and must perforce accomplish the end of their introduction by hazard or otherwise. They were packed into teeth under conditions very unfavourable, and were covered for the most part with wax, mastic or sandarac. The dressings were changed daily or every other day, as convenience indicated, and the suffering patients of those days considered themselves exceedingly fortunate if at the end of two or three months the "tooth" or abscess was pronounced cured and it might safely be filled with a temporary filling. This sort of unscientific disinfection and antiseptic treatment of abscesses and root canals still prevails to a limited extent in some of the larger cities in America, and still more largely in the remote towns and villages situated at a distance from the centres of population. I was among the few who had the temerity to suggest that such practices were only of those that should be labelled antique and be preserved along with other relics of the past.

I will endeavour to show now that however useful a practice may have been in the past, it cannot be of equal value to one that is capable of demonstration to be vastly its superior, not only theoretically, but scientifically and practically.

A tooth containing a living pulp, which must be destroyed to retain it in the mouth, does not need disinfection in the same degree that one does in which the pulp has long been dead. The canal should be kept aseptic from the beginning, but it does not need "treatment" for it is not foul from the generation and absorption of mephitic gases in its central chamber. It is here laid down most emphatically that nothing should be allowed to enter a cavity in a tooth, or the pulp chamber or canal that is not absolutely sterilized, from the application of arsenic or other corrosive or means of destroying the pulp until the root is filled. You may say that this involves labour or detail. It involves both; but it is better

practice and safer for the surgeon and his patient, it insures a longer period of usefulness for the tooth, and greater comfort for its possessor. If the ordinary practice is pursued of making an application of arsenic to the pulp or its equivalent and the cavity is allowed to remain open even for one day, the root canal is contaminated, and disinfection becomes a necessity.

Dental Review.

BETA-NAPHTHOL.

By Dr. JOHN G. HARPER.

THE particular method of preparing the pulp canals and filling is as follows:—Wipe out the debris with cotton wrapped on a broach and dipped into hydrogen dioxide; continue this until all traces of the pulp disappear; then proceed to dry the canal by wiping out the pulp canal with cotton on a broach and dipped in a saturated alcoholic solution of beta-naphthol; this will de-hydrate the canals and dentine, and at the same time rendering them aseptic; the surplus fluid is wiped out and warm air used to evaporate the alcohol, leaving a coating of the beta-naphthol lining the walls of the cavity. Follow this treatment by moistening the canal walls with eucalyptol, as it is a solvent of gutta-percha. Chloro-percha is introduced and pumped carefully into the finer canals; gutta-percha cones are forced into the larger canals until the filling becomes solid gutta-percha. Never fill the pulp chamber with gutta-percha unless you intend to put in a temporary filling in the cavity, to be afterwards removed, removing all the gutta-percha to the mouths of the root canals. I make this statement on account of the liability of the gutta-percha expanding and splitting the tooth.

It is a good rule to fill the root canal pulp chamber and cavity with gutta-percha, and dismiss the patient for a week, in those cases where a gold filling is to be inserted in the cavity.

Archives.

TO KEEP RUBBER DAM FROM SLIPPING.—After the rubber is in place; and the teeth and rubber dried with napkin or bibulous paper, dust finely pulverized rosin on the teeth and rubber. This will generally keep the dam in place, without other aid.

S. G. Welch, Off. and Lab.

REPAIR OF CROWN AND BRIDGE WORK.

BY W. W. WILLIAMSON.

The repair of crown and bridge-work *in situ* has never been a success. Various methods have been devised and set forth in current dental literature, but not one of them has proved either scientific or satisfactory. Realizing the urgent need of some better way, I have hit upon the following simple and efficient method.

Remove the *debris* from the fracture. Grind a porcelain facing to fit. Back the tooth with gold or platinum to suite the required shade. Have the pins well flattened and pressed down on the backing. Bore a hole through the gold in the bridge-piece where it is most desirable to have the post placed. Make the opening of such dimensions that ordinary-sized iridio-platinum wire will fit snugly. Square the hole with a fissure-bur to conform with the shape of the wire. Adjust the tooth in proper position. With a small-pointed instrument mark on the backing of the tooth through the hole in the denture the place where the opening meets the facing. Remove the tooth and solder the end of the post on the backing where marked. Have the post of sufficient length to protrude about one-eighth or one-sixteenth of an inch on the lingual aspect. Cause the solder to flow thoroughly over the parts, being careful to avoid covering the pin except at the attached end. Remove any excess of solder, making the same smooth and symmetrical. Grind from the labial aspect sufficient to allow for extra thickness of gold on the backing. With a thin steel ribbon-saw divide the end of the post, sawing a little below the point of emergence. Countersink the lingual side of the denture to conform to each half of the split post. To attach the tooth use cement, and before it sets bend the two halves of the post steadily and firmly into the grooves prepared for them. Use long-nosed pliers or forceps to press the ends of the post in place, resting one beak against the front side of the facing, the same being protected with a cushion of soft or bibulous paper. Fill any remaining depressions on the lingual side with gold-foil, making anchorage pits of necessary. If the details of the work have been faithfully adhered to, it will be found that the repair, instead of, as heretofore, being the weakest point, will be as strong as the denture itself. By the way, the very fact of the breakage

usually indicates that the place of fracture is the place of greatest wear, hence, when mended, *this* should be *at least* as strong as before. With this improved system of repair the merits of cemented dentures are enhanced manifold, and bridge-work "crowned" with new beauty and strength.

Cosmos.

ABSORPTION AND DISTRIBUTION OF CHLOROFORM IN THE BODY.

Pohl (*Archiv für exp. Path.*, xxviii, Heft 3 and 4, 1891,) discusses in a short introduction to his paper the various views which have been held as to the mode of action of chloroform and other anæsthetics. He then describes at length his method of estimating chloroform quantitatively in animal fluids. A current of air is passed through the mixture for many hours; it takes up the chloroform, and the mixture of air and chloroform being led through a heated tube filled with pure magnesia, the chloroform is decomposed and can be estimated quantitatively by the amount of chloride which it yields to the magnesia. Preliminary experiments with known quantities of chloroform convinced him that the method gives almost absolutely exact results. The experiments were made on dogs deeply under the influence of chloroform. In the blood drawn from such an animal there was got from 0.01 to 0.06 per cent., chloroform, the average amount being 0.035 per cent., being much less than the solvent power of blood for chloroform. The latter must therefore be present in chemical combination. The red corpuscles contained about two and a half times more than the serum. The greater part of the chloroform is therefore combined with the red corpuscles. Further experiments showed that it is not combined with the hæmoglobin, but with the lecithin and cholesterin of the corpuscles. Pohl thinks these bodies have an attraction for chloroform, as they are readily soluble in it. The combination is a loose one. The amount of chloroform in the brain, liver, urine, and fat relatively to the amount in the blood was also estimated. In a dog in which the blood contained 0.015 per cent., the brain (after death by bleeding) contained 0.0418

per cent. Pohl thinks the chloroform is retained by the cholesterin, lecithin, cerebrin, and other substances very soluble in chloroform. In another dog where the blood contained 0.062 per cent., the liver contained 0.044 per cent. Only traces were got in the urine. The fat contained less chloroform than the blood, but the author attributes this to its very small blood supply. The organs rich in substances which are soluble in chloroform seem to take it up in relatively large amount and quickly. After cessation of administration the blood reabsorbs it again and it is excreted by the lungs, the excretion going on for forty minutes at least. Pohl thinks that the solvent action of chloroform on certain constituents of the brain substance does not necessarily explain its narcotic action, as bromides and certain alkaloids also induce narcosis, and for these it has never been shown that they exert any solvent effect. Claude Bernard and Binz have supported the theory that a slight degree of coagulation of the brain substance is produced; but this has never been demonstrated, although it is not outside the bounds of probability. In cases where death occurred the amount of chloroform in the blood was only very slightly higher than in the others. The danger is all the greater, as the blood is never saturated and can readily take up more chloroform. *British Medical.*

ARISTOL.

SOME question has been raised recently as to the purity of the substances met with in commerce as representatives of the compound introduced as an antiseptic first under the name "annidaline" and then as "aristol." It will be remembered that aristol has been described as being obtained by treating an aqueous solution of iodine in potassium iodide with thymol in caustic soda solution (*Pharm. Journ.*, [3], xx., 601). The impurities that it might be expected to contain therefore would be free iodine, alkali, or alkaline iodide. Herr Reuter reports (*Apot.-Zeit.*, Jan. 28, p. 61) the examination of two samples, one of older date than the other. Both upon being shaken with water gave a solution which was perfectly neutral

but which upon evaporation left a residue of alkaline iodide, amounting in one case to 1.6 per cent. Upon treating the samples with ether, in which pure aristol is perfectly soluble with a yellow, not a brown colour, a residue was left from the older specimen amounting to 4.8 per cent., this residue containing much alkaline iodide and possibly an insoluble organic iodine compound. Upon shaking the samples with 1 per cent. potassium iodide solution the filtrate from the older one gave with starch paste an intense colouration, showing the presence of free iodine, but the filtrate from the other remained free from colour. It seems probable, therefore, that the aristol of recent manufacture is less contaminated with free iodine than the earlier specimens, but that it still contains alkaline iodide. In respect to purification Herr Reuter states that if a solution of aristol in cold glacial acetic acid be treated with water and the precipitate thoroughly washed and dried at 60° C., a faintly yellowish product is obtained that dissolves clear and without residue in ether and contains no free iodine. But the question arises whether an absolutely pure preparation is advantageous, for it would appear that pure aristol is much more stable than has been supposed and consequently less likely to act as a bactericide than a preparation rendered unstable by the presence of more or less free iodine or alkaline iodide. This might account for some of the contradictory experiences with this substance that have been reported, as for instance that of Professor Neisser, in whose hands aristol proved quite inactive, except in some cases of lupus, where it was applied to patches that had been treated previously with a caustic.

Pharmaceutical Journal.

COAGULANTS AND NON-COAGULANTS.

By Dr. A. W. HARLAN.

First. Oleaginous non-coagulants for living dentine are better preventatives as antiseptics beneath fillings than coagulants, as they do not destroy the surface with which they are brought in contact. They also permeate the dentine, without irritating it, and are capable of depositing camphors which are powerful disinfectants.

Second. Oleaginous non-coagulants by their diffusibility through dead dentine completely disinfect it, and by their perfect diffusion prevent discolouration of the tooth as they are not solvents of the pigments or sulphides which may gain access to or be found in the pulpless tooth.

Third. Coagulants prevent diffusion not only of themselves but of substances which may afterward be brought into the interior of a tooth.

Fourth. Diffusible medicaments through their non-coagulating properties, offer no mechanical obstruction to the exit of fluids beyond the apices of roots, example blind or cold abscesses.

Fifth. The experiments of Dr. Black, of Chicago, verified by myself, prove that non-coagulants are among the most potent antiseptics and disinfectants, and the necessity does not exist in view of this to use coagulators which are less efficient as agents for disinfecting infected dentine.

If coagulants are to be used at all for purposes of disinfection of dentine, they must be diluted with non-coagulants to a degree that will render them valueless for the purpose of coagulation.

Dental Review.

METHOD OF REMOVING COLLAR-CROWNS.

SOMETIMES it happens that "the other dentist" crowns a root which has been inadequately or improperly treated. The result is an abscess of a painful pericementitis. We wish to remove the crown. Perhaps we admit to ourselves in confidence that the crown itself is better than one which we could make. We are in a predicament. From the patient's standpoint at the moment, we have the advantage. She has lost faith in "the other dentist" and come to us. She is intelligent and fully understands that "the other dentist" is responsible for the abscess which she expects us to cure. We can cure the disease, but if we replace the crown with one of inferior (our own) make we are sure that the intelligence of the patient will be used to our disadvantage. There is but one way out of the dilemma, and that is to remove the

crown so that it may be replaced. This may be done as follows:

With a sharp spear drill, lubricated with glycerine, drill through the backing at a point over the pin. If the drill is well tempered this will be very difficult. Enlarge this hole slightly with a burr, then with a wheel burr cut the pin free from the cap. The crown can now be worked off without mutilating the band. Next the pin remaining in the tooth root must be removed. To do this burr away the cement around it with a fine spear-pointed fissure drill, being careful not to cut the metal itself. This should be done to a depth sufficient to allow a firm grasp of the pin with the sharp-nosed pliers now supplied for bending the pins of artificial teeth. Do not attempt to draw the pin out by direct force, but twist it slightly to disintegrate the cement, when he will be found that the pin will come away with little effort. You have thus succeeded in removing the crown without mutilation.

When the root has been restored to a healthy condition, replace the crown, insert a platinum and iridium pin through the opening in the backing which was drilled to release the original post. Fasten into position with hard wax, remove carefully, invest and solder.

In this way you can preserve the crown made by "the other dentist," with which no fault was found, and after the proper treatment simply reset it, with very little labour to yourself—a good fee and considerable glory.

Dental Mirror.

SECURING BITES.—Have at hand some half-inch brads, and when the wax models for an upper and lower bite are adjusted in the mouth, take a brad with the foil pliers, hold it an instant in the lamp-flame, and place it across the two models on one side. The warm brad will melt its way into the wax, and the touch of a cold wet pledget of cotton will firmly unite the models on that side. Repeating the process on the other side and also placing a brad on the median line will so secure the bite that the models may be removed without risk of separation or displacement.

Cosmos.

STUDIES ON THE ANATOMY AND PATHOLOGY OF
THE TUSKS OF THE ELEPHANT.

BY W. D. MILLER, M.D., D.D.S., BERLIN.

THE EXPOSED PULP.

The process of destruction of the hard tissue of the tooth so well known as decay or caries, does not occur in the tusk of the elephant. Exposure of the pulp is therefore brought about only by mechanical agents. Notwithstanding this fact, evidences of pulp-exposure are very frequently met with by anyone giving especial attention to the pathological condition of the tusks of elephants. In by far the great majority of such cases the exposure is the result of fracture of the tusk, which occasionally gives way at some weak point under the immense strain to which it is subjected in the various uses to which it is put. Less frequently the pulp is exposed by sawing the tusks of tame elephants, either for the purpose of obtaining the ivory or of rendering the animal less dangerous. A case recently occurred in the zoological garden of Berlin, where the keeper in sawing the tusk of a bad-tempered elephant came upon the pulp. Finally, in rare cases, the pulp has been exposed by gunshot wounds. The extent of the exposure will of course be determined by the point at which the fracture takes place, and varies from a mere point, when the tusk is broken near the apex, to an opening two to four inches in diameter, where the fracture takes place at the alveolar border.

When in the human mouth a total exposure of the crown of the pulp is brought about either by caries or attempted extraction, one of three results may be expected : (1) the pulp may and usually does undergo a process of inflammation resulting eventually in partial or total necrosis, although it sometimes remains indefinitely in a state of chronic inflammation without any apparent loss of substance ; (2) it may, especially in the case of molars, become the seat of a new formation giving rise to the so-called polyp of the pulp ; (3) it may become calcified.

The last event, so seldom observed in human teeth, is the usual result of fracture in the tusk of the elephant ; whereas the result mentioned under 1 comparatively seldom occurs, and a polyp of the pulp, in the sense used in relation to the

human teeth, would naturally be impossible in consequence of the rough usage to which the tusk is subjected.

I have observed a number of cases in which the exposed pulp calcified with still less loss of substance than in the case here described ; in other cases again the loss is greater, as in one tusk in my possession in which a piece of the pulp six inches long was thrown off before calcification began.

The wonderful reparative power exhibited by the pulp of the elephant's tusk is well illustrated by the stump of a tusk which I recently saw at one of the ivory depots in Berlin. The very large tusk had been broken off at the alveolar border where the pulp had a diameter of four inches ; the whole of the stump was subsequently completely filled up with a conglomerate of osteo-, vaso-, and tubulo-dentine in varying proportions.

The following case is of unusual interest because its exact history is known. In sawing off the tusk of one of the elephants in the zoological garden of this city, the operator came upon the point of the pulp (not however without the evident disapproval of the elephant). Having heard of this fact from the keeper, I patiently waited for six months, when another small piece was sawn off which I obtained for examination. It showed a slight deposit of irregular ivory just about the point of exposure, indicating an inflammation of the pulp at this point ; beyond this everything was in a perfectly normal condition, and the pulp had gone on performing its function of depositing ivory with no apparent disturbance or interruption whatever.

Here again, as everywhere else, we observe a fact that may not be quite welcome to the advocates of eburnitis, viz : that the ivory itself, where it was sawed through, does not show a trace of any reaction. I have, however, already multiplied to such an extent the proofs of the reactionless nature of ivory under the severest irritations, that it is certainly not necessary to refer to this fact more in detail in the present connection.

The reaction of the pulp when exposed by gunshot wounds has been referred to in a previous communication (*DENTAL COSMOS*, July, 1890).

Occasionally the exposure of the pulp by fracture of the tusk the base seems to be accompanied by much more serious results, as seen in the case of a captured elephant, who broke off both his tusks in a fit of rage and had to suffer the consequences in form of a large abscess on each side of the

jaw. C. S. Tomes states that inflammation and destruction of the pulp often follow the sawing of the tusks of captured elephants, if this be done too near the socket in a young animal. ("Transactions of the Odontological Society of Great Britain." 1878, p. 77, note.) In accordance with my experience I should modify Tomes's statement by substituting sometimes for often. I am inclined to believe that a total destruction of the pulp, unless the injury has been of a most violent nature, is a very rare occurrence. The pulp of the elephant's tusk sits upon a broad, open base, so that total necrosis in the way in which it often occurs in the human tooth, by strangulation at the apex of the root cannot take place.

I have frequently been asked whether I supposed that the elephant whose pulp was exposed suffered much pain. I am not able to answer this question from direct observation. In the case above referred to, when the pulp was sawed open, the elephant began to cry "most fearfully," and the only way in which the operation could be completed was to saw in from the opposite side and then break the tooth off with a heavy hammer. When the tusk was sawed a short time ago, the elephant apparently remembered the previous operation, and it was with considerable difficulty that he could be prevailed upon to submit to what he thought might be a repetition of the former experience.

Inflammatory processes in the contracted portions of the pulp towards the apex of the tusk, in all probability give rise to pain very like that accompanying pulpitis in human teeth; towards the base of the pulp, where expansion of the tissue may take place, the pain is probably not so intense.

In the human tooth the calcification of a pulp which has been exposed by breaking off the crown in an attempted extraction is an event of such exceedingly rare occurrence that up to the present but one case of this nature has been described in dental literature. This case will be found in Tomes's "System of Dental Surgery," under calcification of the pulp:

"A patient applied to have the roots of a first molar removed, the crown having been broken off many months previously, when, for the relief of pain consequent upon caries, the extraction of the tooth was attempted. The pain ceased after the fracture, and the roots of the tooth were allowed to remain. After the lapse of some months, the remains of the broken tooth caused annoyance and they were removed. The tooth

was broken through about the middle of the pulp-cavity, projecting from which was a mass of secondary dentine. It not only projected from the cavity, but hung over and concealed the sharp edges produced by the fracture. It is obvious that in this case the vitality of the pulp was maintained, that it become enlarged subsequent to unsuccessful operation, and and afterward calcified.

In an unsuccessful attempt to extract an upper first bicuspid for a young girl, the crown was broken off at the margin of the gums and the pulp thereby freely exposed. One and a half years later she applied to Zahnarzt Dieck to have the root removed, as it caused her some annoyance through the irritation of the gums. The end of the root was found to be completely closed by a calcified mass. Not only was the opening closed, but the new formation of hard substance considerably overlapped the broken edges of the root and at the same time the root canals were filled up with a semi-calcified mass. A longitudinal section of the cervical portion of the root presented under the microscope the following structural peculiarities: The outer layer consisted of an almost structureless, transparent substance, bearing no resemblance to dentine; this was followed by a zone of a very irregular substance containing numerous microscopic spaces, which in some case have a certain resemblance to bone lacunæ; mostly, however, were shapeless.

This zone is followed by a third in which dentinal tubules appear and the structure became in places very much the same as that of normal dentine; below this came the calcified but not dentinified remains of the pulp. Evidently in this case the exposure was followed by considerable proliferation of the pulp. Whether this was protected by the gums or by the neighbouring teeth, or whether the patient used the other side of the mouth exclusively in eating, I am unable to say; at all events the insults to which the soft tissue was exposed were not too great to prevent a process of calcification taking place in the periphery, giving rise to the structureless layer. This having been formed, it afforded a certain protection to the pulp, which appears gradually to have undergone a process of reorganization, giving rise to the irregular substance, followed by the comparatively regular dentine. Or we may suppose that in the proliferation of the pulp the odontoblasts took part only in the beginning and that subsequently the growth was confined to the other non-specific elements of the

pulp, consequently in the outer portions there would be no odontoblasts and therefore no dentinal tubules. Others again who assert that the connective tissue cells of the pulp may become transformed into odontoblasts and perform their functions would explain the presence of dentinal tubules in this case as they do in case of pulp-stones, on the supposition that even if the odontoblasts totally disappeared from the surface of the pulp they would be reformed again after it became protected by a crust of calcific matter. Which, if any, of these views is the right one, the reader must decide for himself. I shall however, revert to this question in the next article of this series.

The fact that the elephant's tusk usually does, and that that of the human tooth when freely exposed may become calcified in spite of the constant irritation to which it is subjected, gives rise to the question whether any use of this evident self-protecting power of the pulp may be made in the conservative treatment of this organ; whether in case of total exposure, or of hypertrophy or polyp of the pulp or even of partial exposure a metallic cap (probably best of lead), fixed in place by cement, simply to protect the pulp from injury, might not under certain conditions result in calcification, where the ordinary capping of cement would be followed by the death of the organ.

A case which lends support to this suggestion was reported by Sauer in the *Berliner Klinische Wochenschrift*, 1867, No 24. A portion of the crown of an incisor was broken away by the kick of a horse, freely exposing the pulp. Two weeks later Sauer fitted a cap of gold over the tooth, and the opening of the pulp-chamber completely closed within three weeks.

Cosmos.

THE DENTAL PULP.

BY W. XAVIER SUDDUTH, AM., MD., D.D.S.

Objection has been raised against the use of the term dental pulp, some holding that the formative organ of the dentine should be called the dental nerve, as it is even now designated by the laity, because of the fact that when in an inflamed condition it is extremely sensitive.

Considered from the stand-point of histology and compared with other portions of the body, we find that it is much less highly organized and presents few of the special characteristics which entitle it to classification as nervous tissue. The greater portion of the mature pulp is composed of ordinary connective-tissue elements being made up of filiform and fusiform cells presenting no regularity in arrangement but crossing and anastomosing in all directions.

Upon the surface of the pulp, forming part of it, is a layer of cells termed odontoblasts. They are developed from the ordinary embryonic connective tissue cells, but are specially endowed with the function of secreting the dentine. These cells are possessed of one or more fibrous prolongations which extend into the tubuli of the dentine. To these fibres of the odontoblast has been given the name of dentinal fibres because of their location.

The pulp is a very vascular organ. Its blood-supply consists of a few vessels of considerable size and numerous capillaries, which ramify throughout the entire organ.

It is also well supplied with nerve elements. These consist of medullated and non-medullated nerve-fibres which terminate in the odontoblastic layer. They do not, however, present the same fineness of subdivision as if found in the terminal nerve-fibres of the cornea.

Some writers hold that the sensitivity of inflamed dentine in decay indicates the presence of nerve fibres in the dentinal tubuli. Such is not necessarily an absolute deduction, as an inherent property of protoplasm is the power of conducting sensation, which latter is not confined to nerve-fibre alone. It is also well known that in inflammation this property is highly exalted. The term sensitive dentine is a misnomer, as the sensation is confined to the dentinal fibrillæ, and the degree of sensitivity is in the inverse ratio to the attenuation of the fibre ; hence the most sensitive point is found at the union of the enamel and dentine, where the fibres reach the finest sub-division. The more delicate the filament the more exalted its power of transmitting sensation, and inflamed dentine does not present any distinctive features not exemplified in other portions of the body under similar inflammatory conditions.

The most common conditions of inflammation that dentists come in contact with are pulpitis and periodontitis. They are not, as a rule, called upon to treat inflammations in other portions of the body, consequently are but little acquainted with

inflammation in its general aspect. There are several places where inflammation is even more intense and painful than it is in the pulp. The eye is a most notable example, also the ear and the organs of generation, not to speak of the central nervous system.

Periodontitis is allied to inflammation in the periosteum, and differs in no whit from such processes wherever found in connection with the osseous system, and is always very painful. It appears to be the tendency of dentists to magnify the intensity of the conditions they are called upon to treat, as we have intimated because of their limited acquaintance with the processes of inflammation in general while the tendency among physicians is to minimize the conditions, because of their lack of knowledge of the special conditions found in the mouth.

It is not our intention to displace the dental pulp from the list of sensitive tissues when inflamed, because it does not differ from other tissues under similar conditions, but to compare it with other tissues in order to impress upon the mind the need of greater care in manipulation. Dentists, as a rule, when judged from the standpoint of delicacy of touch and carefulness in manipulation make a very poor showing when compared with ophthalmologists.

An indifference to expressions of pain seems to grow upon some dental practitioners as practice increases, and they find themselves growing less appreciative of the niceties of practice which gained for them their reputation as careful operators. If the above stricture is true, and we firmly believe it is, then the reputation of the dental pulp to be the most sensitive organ of the body is largely due to our carelessness as operators.

Before dentistry was known, the favourite expression for a condition of extreme sensitivity was "as tender as the apple of the eye," but now, thanks to an extended acquaintance with the operating chair, the more modern phrase, "as tender as the nerve of a tooth," has been introduced. This comparison is not intended to be invidious, nor to build up one speciality at the expense of another. It is well, however, at times, to see ourselves as others see us. Let us see to it in the future that the incubus is removed from our shoulders, and the "apple of the eye" restored to its former position as the most fitting term of comparison for extreme sensitivity.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Ordinary Monthly Meeting, *April 6th*, 1891. Mr. S. J. HUTCHINSON, M.R.C.S., L.D.S., *President*, in the chair.

The minutes of the last meeting having been read and confirmed,

The PRESIDENT stated that on the recommendation of the Council he nominated Dr. Horatio C. Meriam, of Salem, Mass., U.S.A., for Corresponding Membership.

Dr. A. W. W. Baker and Mr. J. H. Badcock, having signed the Obligation Book, were admitted to Membership by the President.

Messrs. Charles Alexander Clark, L.D.S., of 7, London Road, Forest Hill, S.E.; and Stephen Arthur Coxon, L.D.S.I., of 4, York Road, Wisbech; and Vernon Knowles, L.D.S., of London Road, Reading, were balloted for and duly elected members.

The LIBRARIAN (Mr. ASHLEY GIBBINGS) reported that Mr. J. Worsley had presented to the Library two books, interesting from having been published nearly ninety years ago. One, "A Dissertation on Artificial Teeth," by M. Dubois de Chemant, 1804, and the other, "The Natural History of the Human Teeth," by Joseph Fox, 1803, as well as the Smithsonian Report for 1888.

The CURATOR (Mr. STORER BENNETT) announced the presentation of two sets of models; one by Mr. Moon, of Croydon, of an exceedingly under hung bite; and one, by Mr. Biggs of Glasgow, of cleft palate—the cleft being very large. This was specially interesting on account of the excellence of the model, the upper parts above the soft palate being particularly well defined. Mr. Biggs had assured Mr. Claude Rogers, through whom the model had been received, that it had not been touched in any way.

The PRESIDENT called upon Mr. Penfold for his communication.

Mr. PENFOLD said that the specimen of salivary calculus, which he brought before the Society's notice presented some unusual features. One was that these two masses were in-

dependent and fitting closely to one another and occupying the space between the cheek and the upper maxilla on the right side of the face, giving the patient an appearance of onesidedness, but with nothing to excite suspicion of dental abscess being the cause of it. The patient came to Mr. Penfold for relief of pain in teeth on the left side, and it was in making an examination of a carious canine that he discovered the existence of a hard substance lying between the cheek and the tooth. On enquiring as to the history of the growth, he was told not on any account to touch it as it was a tumour, which the doctors said was incurable. As nothing could be done with the mass *in situ*, he risked the danger and removed first one and then the other with the fingers—they having no attachment whatever. The patient was unable to account for the horizontal position of the second molar in the posterior portion, but it seemed probable that it had assumed that position gradually, partly in consequence of alveolar absorption and partly by the pressure exercised by the growing mass of tartar. The patient complained of no special discomfort from what in most adults would at least have been regarded as inconvenient.

The PRESIDENT then called upon Mr. Walter Coffin, who said that by the kindness of Prof. D. J. Cunningham, M.D., of Dublin, he exhibited photographs of the skeleton of an Irish giant, Cornelius Magrath. The skull and several bones were exhibited on Feb. 24th last, at the Anthropological Institute, by Prof. Cunningham, who had to take them back to Ireland, but had kindly lent the photographs.

The principal point of interest, very inadequately shown by the photographs, but very striking on examining the specimen itself, was the continued growth—and in this case the ultra-gigantic growth—of the lower jaw, almost identical with the case of the living patient exhibited before the Society in 1889, by the President, Mr. Sewill, and when the Society enjoyed the advantage of the symptom being described by Mr. Jonathan Hutchinson as characteristic of a rare pathological condition called acromegaly. In this case the skull was by no means large, nor could Mr. Coffin feel satisfied that the extremities were abnormally developed, but when the mandible was properly articulated it was impossible to bring the teeth into occlusion, although the molars all bore traces of wear from mastication, probably in youth. The third molars were large. A very peculiar, and perhaps accidental or

adventitious circumstance, was that the teeth purporting to be and occupying the position of the upper centrals were much smaller than the lateral incisors. Prof. Flower, whose attention was called to this by Mr. Coffin, thought that other than the proper teeth must have been substituted in preparing the specimen, but Mr. Coffin could not satisfy himself that there was evidence of such *post-mortem* implantation, and trusted that Irish members of the Society would clear up this very mysterious and interesting point. Cornelius Magrath was a native of Tipperary, born in 1736, and died in Dublin in 1760. Prof. Cunningham estimates his height at seven feet two inches only, though he enjoyed the reputation of being over eight feet.

Mr. COFFIN, at the suggestion of the President, promised to obtain, if possible, a cast of the jaws for the Society.

Mr. BRUNTON then showed models taken from the mouths of two boys, brothers, ages eleven years and two months, and thirteen years and eleven months. The former has only the four six year molars and two upper central incisors of the second set. There is not any appearance of the other permanent teeth being in the jaws, while the elder of the two had only the two six-year molars and one central incisor, the left, in the upper jaw. The other central incisor had been extracted and none other in the mouth. All the teeth of the first set were in the lower jaw and the canines and molars in the upper jaw. The teeth of the first set in both boys were much worn down. The teeth of the second set were remarkably small.

Some neat and convenient basins for mixing plaster of paris for the surgery were shown. They were made by cutting in half the toy balls found at the shops which are made of thin celluloid. Some very simple and efficient points for drying root canals, made from paper, such as that used for water-colour drawings were exhibited. The paper is first boiled in bichloride of mercury one in a hundred, and when dry is cut in strips, folded, and cut in such a way as to produce a taper point of about three-quarters of an inch long with a groove running the whole length of the point. The idea was suggested from observing the proboscis of insects. Some of the diptera have a proboscis which is simply a rod with a groove running the whole length, the nectar of the flowers where the proboscis is thrust in, finding its way to the mouth of the insect by capillary attraction along the groove. There are three thicknesses of the drawing paper, so that any

desired size or thickness of point may be made. Drills were shown for clearing the canals in teeth, made from piano wire, in shape somewhat like the "Morey" drill, the toughness of the piano wire preventing to a great extent the breaking of the drill in the canal. Pliers for handling canal points, posts, pivots, &c., were shown. The inside of the blades were grooved in the same manner as the blades of extracting forceps.

Dr. A. W. W. BAKER remarking upon Mr. Coffin's communication said that it was a very interesting one, and he should be very happy to render any assistance in his power in obtaining the desired casts.

The PRESIDENT then called upon Mr. A. Pearce Gould for his paper. (See page 433).

DISCUSSION.

The PRESIDENT felt sure that the Society would heartily concur in thanking Mr. Gould for his valuable paper. Before making any remarks he would like to ask if there were any hooks or wires on the plate?

Mr. PEARCE GOULD replied that there were not.

The PRESIDENT continuing, said that the paper seemed to divide itself into four heads, the popular point of view, the dentist's point of view, the surgeon's point of view, and the pathological point of view. Mr. Gould had referred to Mr. Felix Weiss's paper, which was one of great interest, but the President thought that the paper they had just listened to would add considerably to their knowledge of this question. The popular aspect of the case seemed to be, that people would persist in disregarding the danger attendant upon wearing insecure dentures, and continue to wear them after the fastenings had been broken; Mr. Gould had pointed out the duty of the dental surgeon to draw attention to this danger so that he (the President) need not further enlarge upon it. The next point was, that an examination of the pharynx revealed the fact that the plate was imbedded at the back of it in such a way that it could not be dislodged. The pathological results which followed were extremely interesting and pointed to the necessity of treating these cases on their first onset. Mr. Hutchinson would like to ask if it would have been possible to ascertain from the patient the shape of the plate and the material of which it was con-

structed ; and whether it would have been possible to break the plate in its position in the throat with a lithotrite.

Dr. DUDLEY BUXTON narrated a case which illustrated one of Mr. Pearce Gould's points, viz., the difficulty there often was in making certain whether or not the plate is still in the pharynx. A young man was admitted into a provincial hospital and Dr. Dudley Buxton was able to strike a plate in the pharynx, but not on all occasions, and others failed to make out its existence. However it was finally decided to perform œsophagotomy, but before this was done a member of the consulting surgical staff passed forceps and although repeated prolonged efforts had previously been unsuccessfully made, this gentleman succeeded in withdrawing the denture through the mouth. Another point was the use of emetics which Dr. Dudley Buxton would most decidedly deprecate. It had once been his duty to read a communication from a medical man describing such a case of impaction of a tooth-plate in which the author rather prided himself upon having employed emetics, and thereby succeeded in recovering the missing denture. In Dr. Dudley Buxton's view forced vomiting should be carefully avoided, as if true impaction existed there was grave danger of hooks or sharp edges lacerating the mucous membrane. The President had suggested the use of a lithotrite for crushing the plate, Dr. Dudley Buxton had been told by Mr. Buckston Browne that he had more than once used a lithotrite as a substitute for œsophageal forceps.

Mr. C. V. COTTERELL suggested that if the material of the plate had been doubtful, its being made of metal or not might have been decided by the aid of an electric battery if a galvanometer were included in the current with the exploring instrument ; the contact of the latter with a foreign body of metal would be indicated on the galvanometer.

Mr. W. B. PATERSON said that while looking at the specimen it had occurred to him that the plate did not seem to him to be beyond the range of vision aided by a speculum, laryngoscopic mirror and electric lamp. The plate being once seen he presumed œsophagotomy would have been decided on.

Dr. JOSEPH WALKER related two cases in his experience, treated differently but both with happy results. The first was that of a female who swallowed a upper gold denture, she felt no inconvenience and only slight pain. Dr. Walker

avoided emetics and subscribed oatmeal drink and on the eighth day the entire denture uninjured and buried in a glutinous mass of oatmeal was evacuated through the rectum. The other was that of a policeman in Westminster who swallowed a denture consisting of four teeth, with gold clasps round the canines, mounted on a heavy gold plate; he was inverted and in about ten minutes the gold plate rolled out of his mouth. In conclusion Dr. Walker desired to thank Mr. Gould for his paper which he regarded as educational from its first note to its close.

The PRESIDENT remarked that the important and most interesting point which had arisen in the discussion seemed to be as to the value or otherwise of emetics, and he would be glad to hear any other members who had had experiences similar to Dr. Walker's.

Mr. C. V. COTTERELL stated that in 1879 he took a practice down at Rochester where a patient had just swallowed a platina plate that held three or four teeth which were retained simply by a pivot pin in the root of the central tooth. It had very sharp points; the collars were cut up to points to go between the teeth and the pivot pin he would say was $\frac{3}{16}$ to $\frac{1}{2}$ inch long—it went from the lateral to the first and second bicuspid. The doctor in this case recommended emetics, but the dentist, Mr. Robertson who had since died, prescribed oatmeal and chopped worsted and the prescription was followed; in five days the plate was passed without the slightest trouble.

Mr. BRUNTON said that the case which formed the subject of Mr. Gould's paper seemed a most interesting one. The point which struck him was this, did Mr. Gould seek the assistance of a dentist in trying to find out the probable size, shape, and nature of the denture? It seemed to Mr. Brunton that it would have been a considerable help to have had the assistance of a dentist.

Mr. PEARCE GOULD, in response to the invitation of the president, said he would reply first to the last speaker; he did not, as he ought to have done no doubt, seek the help of either of his dental colleagues. Mr. Hern was in the hospital while the patient was on the operating table but Mr. Gould did not ask him specifically about the size or nature of the plate. There was this point about it, he (Mr. Gould) had found the plate once and expected to find it as easily again, not doing so he was perhaps taken a little off

his guard. With reference to breaking the plate, it was his intention to do so if he could have seized it with the forceps but not seizing it the question did not arise. He would add that he should think it would be a difficult matter to break it in that position. With regard to giving of emetics, emetics had been given in some cases without good results while in others no serious consequences had occurred; personally, although he did not think emetics were of much good, he did not think much harm could follow when anything could be swallowed—he would not recommend apomorphia injection. Then as to the suggestion of detecting metal plates, there could be no doubt that under certain circumstances it would be possible, but this not being a metal plate the question did not arise. Mr. Paterson put a very pertinent question as to the possibility of seeing the plate. The first thing Mr. Gould did was to try and see the plate, but the second time he omitted to do so; he would have been better advised had he acted otherwise; and he should have put that among the final conclusions of his paper that the best means of ascertaining the presence of a foreign body in the œsophagus is by inspection; unfortunately he had to confess that in this case he was misled.

MANCHESTER ODONTOLOGICAL SOCIETY.

THE usual monthly meeting of the above Society took place on Tuesday, April 7th, at the Victoria Dental Hospital, Grosvenor Street. Mr. Murphy, *Vice-President*, in the Chair.

Messrs. J. S. Acton, F. S. Elmitt, and W. E. Harding were elected members. An application for membership was read from Mr. E. Williams.

CASUAL COMMUNICATIONS.

Mr. J. W. DUNKERLEY said they had all met with patients who boasted that they had never removed their plate from their mouth since it had been inserted. He met such a case

a short while ago, and on "scraping" the plate he was able to gather a quantity of what appeared to be a fungous growth. He also obtained some from the remaining teeth. He had brought it there that evening for the purpose of showing it under the microscope. It seemed to be the form which Miller described as *Leptothrix Gigantis*. The spores were not killed by being immersed in iodoform, and were easily kept alive by means of a little sugar and water.

Mr. RENSCHAW exhibited part of the fossil jaw of an animal which he believed was a musk deer. A friend of his was in Lincoln some time ago watching some men dig the foundations for a house. About nine feet below the surface the workmen came upon a portion of Roman pavement, and two feet below the pavement were found a number of anatomical specimens, of which his friend succeeded in getting the one in question. The teeth were in excellent preservation, but the bone was very brittle.

Mr. PLANCK pointed out that if the facts were correct, the specimen must be something like 1400 years old.

Mr. HOOTON and one or two other members questioned whether the jaw was that of a musk deer, Mr. Hooton believing it was that of a young ox, and it was decided to admit it to an expert and announce his opinion at the next meeting.

Mr. RENSCHAW showed a photograph of an improved spittoon which had been designed by himself and Mr. Murphy, and which he thought would be of great use in the operating room. He also explained its advantage.

The members then separated to watch the practical demonstrations.

Mr. C. R. MORLEY filled an interstitial cavity in an upper central with gold, starting with soft and finishing with cohesive cylinders.

Mr. J. W. DUNKERLEY demonstrated the cutting of microscopic sections of teeth and other hard tissues.

Mr. G. G. CAMPION demonstrated the cutting and staining of sections of carious dentine.

Dental News.

FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—

At the May sittings of the Dental Board the following Candidates were admitted Licentiates in Dental Surgery :—

George Foster, Birmingham; Henry E. Goddard, Nottingham; C. W. Croft Handley, Stoke Newington; Percy T. Naden, Birmingham; Thomas D. Nicah, Partick; Frank Vincent Walker, Doncaster.

The following passed the first Examination :—Samuel Anderson, Glasgow; Henry Taylor, Glasgow. Four Candidates were referred.

ROYAL COLLEGE OF SURGEONS IN IRELAND.—Dental Examination.—The following gentlemen having passed the necessary examination have been granted the diploma in Dental Surgery of the College :—A. R. Mechan, Dundee; A. Richards, London; H. W. O. Tibbits, Richmond.

GLASGOW DENTAL HOSPITAL.—PRIZE COMPETITION. In the Annual Report of the Directors published some time ago, it was announced that a sum of £100 had been gifted by Mr. James Wallace, Dental Surgeon, to the Hospital, for the purpose of fitting up a Laboratory in the Hospital and providing a prize of £20 per annum for four years to the most successful student in mechanical Dentistry and in General Hospital practice the competition for the first year prize of £20 has just been completed, and the prize has been awarded to Mr. James Diedi Forrest, son of Dr. Forrest, 14 Butterbiggins Road.—

APPOINTMENT.

Frederick W. Minshall L.D.S.I., has been elected on the Staff of the Victoria Dental Hospital Manchester as Assistant Dental Surgeon.

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ON APPLYING ARSENIC TO EXPOSED PULPS.*

By G. N. SKIPP. L.D.S.E., & I.

MR. PRESIDENT AND GENTLEMEN.—Notwithstanding the many improvements which have been made in operative dentistry, no thoroughly reliable method has yet been introduced to entirely obviate the necessity of destroying the dental pulp.

Various drugs, and combinations of drugs, have been used, but none found efficient where arsenic, in some form or other, has not entered into their composition.

The application of arsenic to an exposed pulp is not always an easy matter, for not only has it to be placed in direct contact with that organ, but also retained in position for a considerable period, and all leakage to the surrounding tissues prevented.

The process of devitalizing the pulp is invariably painful to the patient; a great deal of unnecessary pain may however be avoided, not so much perhaps by adding a sedative to the devitalizing agent, as by preventing undue pressure.

In ordinary toothache the pulp becomes inflamed, but cannot relieve itself by swelling, owing to its being surrounded on every side by the unyielding walls of the pulp chamber, and the severe pain may be put down, in a great measure, to the pressure of the congested blood vessels upon the delicate nerve tissues.

The practice of simply washing out a cavity, and applying a small pellet of tightly rolled cotton wool dipped in some arsenical paste to an exposed pulp, then driving it well home with another compressed plug of the same material, saturated

* A paper read before the Manchester Odontological Society.

with nauseous varnish, cannot be too strongly suspected as an indubitable cause of the intense pain and inconvenience experienced during the process, known to our patients as "killing the nerve."

Instead of being allowed the slight relief afforded at the point of exposure, the highly inflamed and irritated pulp is driven back, and forced into its chamber, only to be still further compressed, as the inflammation increases, and the cotton absorbs moisture.

A more humane treatment can be adopted by excavating as much as possible of the softened dentine which is sensitive to pressure, leaving a margin of comparatively hard dentine round the edges of the cavity, and applying a small quantity of arsenical paste to the pulp, over which a cap of telephone plate, or thick tinfoil turned up with an ordinary burnisher, is fitted to prevent pressure. The cavity is then sealed for 24 hours or upwards, with either gutta-percha, osteo-filling, varnish, wax, or plaster of Paris. Of these, gutta-percha is most useful for crown cavities with plenty of depth, or where the patient insists upon removing the dressing on the first intimation of pain, and osteo-filling in shallow saucer shaped cavities of insufficient depth to hold either gutta-percha or varnish.

A solution of gum benzoin in alcohol makes an excellent medium for all ordinary purposes ; it is pleasant to the taste and smell, sets fairly hard, especially when mixed with a little osteo-powder, is less sticky than mastic, therefore more easily packed. It is sufficiently porous to absorb the secretions of the pulp, without allowing the arsenic to escape, and can on that account be used with greater safety in cavities situated below the gum, or where it is impossible to keep away the saliva. Take for instance, an approximal cavity in a lower molar, with decay extending far below the gum, the latter having grown up from irritation produced by the sharp enamel edges, and, filling the cavity, rests upon the exposed pulp. Intense pain is caused upon the slightest pressure, both from the pulp being pressed upon, and the inflamed gum forced against the enamel edges. Obviously one's first step is to get rid of the gum. This can be done with a sharp lancet without much pain, after placing, for a few minutes, a small quantity of solid cocaine between it and the cavity. The bleeding which follows is quickly arrested by touching the cut edge with a little nitrate of silver, but even with the

gum removed and the bleeding staunched, it is in such a case no easy matter to keep the cavity dry enough to admit of a watertight guttapercha or osteo-filling. Where a non-absorbent filling is used below, or near the gum edge, it is very necessary that it should be perfectly water-tight, otherwise a channel is left, leading directly from the gum to the pulp, and a concentrated solution of arsenic pumped to and fro at each pulsation, after the little cap has become filled with the secretions of the pulp. Where varnish is used, with the precaution of placing a small plug first over the gum edge, this does not happen, as the secretions are taken up, and diffused into the body of the dressing.

In crown cavities filled with gutta percha, or oseo, with no provision made for absorbing the secretions by an additional pad of bibulous paper, or cotton over the cap, the pain is considerably aggravated by the pulp being unable to relieve itself, and severe periostitis sometimes set up, especially should the patient delay the next visit for a week or more. With the use of varnish no secondary irritation follows, even after the lapse of some weeks. A varnish dressing is thought to be unsafe, owing to the facility with which the patient can remove it, and the chance of the arsenic lodging upon the gum. I do not, however, think there are any grounds for such fear when the arsenic is applied directly to the pulp, and not united with the dressing. The cap will either come away embedded in the dressing, or remain *in situ* out of reach.

One application of arsenic will be often found to completely devitalize the pulp. There are, however, instances usually after long exposure, where the pulp becomes fibrous, or infiltrated with lime salts, offering considerable resistance, and repeated dressings produce little effect. In such cases an incision should be made with a probe, dipped in the arsenical paste and should this fail, and where practical, the body of the pulp may be removed with a sharp bur under nitrous oxide, when the remaining portion left in the roots will generally succumb to the next dressing.

Sometimes, however, from the discoloured appearance, and the absence of arterial bleeding, the pulp seems virtually destroyed, but still retains the power of producing so much pain, as to prevent its removal, though unlike a live nerve, all pain ceases on the withdrawal of the instrument. Here a further application of arsenic is unnecessary, as I take it the

blood vessels have been obliterated, though the nerve fibres have not lost their power of conducting sensation.

The blood supply once cut off, it is merely a matter of time, and I have usually found treatment with absolute alcohol, or pure carbolic acid, and a dressing of iodoform, all that is required for the removal of the pulp at a subsequent sitting.

A continued application of arsenic, sooner or later, sets up periostitis, and sometimes produces a peculiar staining of the dentine, shown in specimen No. 1. An upper molar in a similar condition from the same cause, was exhibited to the Society by Mr. Dougan, who had it extracted from his own mouth.

No. 2. In large shallow cavities at the necks of bicuspid and molars the difficulty of retaining the dressing is easily overcome, by passing silk round the tooth, and tying the knot over the dressing, when the swelling of the cotton will prevent the silk from passing up under the gum.

No. 3. Preparatory to crowning, occasionally we have to destroy, the remains of the pulp, when it is near the surface of the root with scarcely any cavity to hold a dressing. In the case of a 2nd bicuspid for instance, where the 1st bicuspid and molar are standing, a strand of silk may be passed round each tooth, and crossed in the centre; this will secure the dressing firmly in its place without much discomfort to the patient.

Or, where the pulp has sloughed away some distance up the root, in an upper central, for example, a small bit of cotton saturated with oil of cloves, should first be passed up, after which arsenic on wool, followed by the varnish plug. The object of the first piece of cotton, is to remove any arsenic that might be left behind, after the other dressings have been withdrawn.

Specimen 4 shows complete calcification of the pulp.

Specimen 5, a large pulpstone.

When these conditions give persistent trouble, by either enclosing nerve filaments within the calcified substance, or squeezing up the remains of the pulp into some inaccessible corner, it is a question whether anything short of extraction, is likely to give relief to the patient, or satisfaction to the operator.

FRACTURED JAW ; ITS MECHANICAL TREATMENT FROM A DENTAL POINT OF VIEW.*

By STANLEY READ, L.D.S. Eng.

Mr. President and Gentlemen : In reading this paper to you this evening, I do not pretend to bring before you any invention or new treatment of my own, but to put in a few words all that is practically necessary to know in treating fractured jaws from a dental point of view. I consider that nearly all fractured jaws should be treated by a surgeon with the assistance of a dental surgeon. In fact, I go so far as to say that no surgeon should treat a fractured jaw without first consulting a dental surgeon, as to whether he could not adjust an interdental splint for the greater comfort and benefit of his patient.

FRACTURES OF THE UPPER MAXILLÆ.

Fractures of the Upper Maxillæ are usually met with in severe smashes of the face. They are often impossible to rectify, and considerable deformity frequently remains. Although much comminution may occur, serious necrosis, in consequence of the great vascularity of the parts, rarely results, though detached spiculæ of bone often exfoliate.

Fractures of the upper jaw of a simpler nature may be occasioned by a blow of slight force, or even, in a condition weakened by disease, by the force required to extract a tooth.

There is not generally much displacement, owing to the fact that the jaws are immovable and the slight muscular action possible. Of course, the force of the blow may cause a great deal of displacement, and this is usually the only cause of the displacement present. These fractures are nearly always compound Inferior Maxillæ.

FRACTURES OF THE INFERIOR MAXILLÆ.

Fracture of the lower jaw is much more common than that of the upper, on account of its more prominent and exposed position. It is usually the result of direct violence, and in most cases of fracture of the upper there is also a fracture of the lower jaw as well.

* Read before the Students' Society of the National Dental Hospital.

The fracture may extend through any portion of the bone, but the most common sites for it are on either side of the symphysis, down the socket of the canine, and at the neck of condyle, but very seldom at the symphysis and at the angle.

Whenever the fracture involves the alveolar process, it is always compound, owing to the extreme thinness of the mucous membrane, and the very close manner of its adhesion. Though compound, they usually unite as easily as simple fractures.

There is seldom any permanent injury caused to the inferior dental vessels and nerves, though they run through the canal in the bone. The injury, such as partial loss of sensation, soon passes off, and I cannot find any record of a permanent injury. As in the upper, the force required to extract a tooth may fracture this jaw, but it is usually only the alveolar process, or else the bone is weakened by disease.

The displacement is, as a rule, very slight, especially in cases of fracture at the symphysis, owing to each portion being acted upon by a similar set of muscles, and at the angle or ascending ramus, owing to its being kept in position by the masseter externally, and the internal pterygoid internally. When there is a fracture on each side of the symphysis, the central portion is considerably depressed, owing to the combined actions of genio-hyoids and the digastric pair of muscles, and in such a case the obliquity of the fracture is generally at the expense of the outer tablet of the fragment. If the fracture is through the neck of the condyle, as occasionally happens, the condyle of the injured side is dragged forwards by the action of the external pterygoid, while the remainder of the jaw is tilted over to the injured side by the unopposed action of the other external pterygoid. This sign is important in distinguishing a dislocation from such a fracture, as in that case, the jaw is drawn over to the side opposite to the injury. If the line of fracture runs through the coronoid process, the loosened fragment is drawn up by the action of the temporal muscle, and this is the most painful fracture that occurs to the jaws, and of necessity not capable of being treated by a dental splint.

SIGNS OF FRACTURE.

The common signs of fracture are distinguished by pain on mastication if attempted, dribbling of saliva, some irregularity in the line of the teeth, a rent in the mucous membrane, dis-

placement of the fragments, and, of course, the history of some blow.

NON-UNION.

The causes of non-union are Local and Constitutional.

The Local are : (1) Fragments not having been kept at rest ; (2) the fragments not having been placed in apposition in consequence of muscular action, the loss of a large portion of bone, the intervention of a tooth, piece of muscle, tendon or periosteum ; (3) The necrosis of the end of one of the fragments.

The Constitutional causes—

Syphilis, struma, gout, Bright's disease, fever, scurvy, the cancerous cachexia, pregnancy, old age, alteration of patient's habits, and sudden deprivation of stimulants are said to be constitutional causes. No doubt any condition which lowers the vitality and consequent power of repair of the tissues has a tendency to delay union, but it seems doubtful if any of the above conditions, except scurvy, is in itself sufficient, apart from any local causes to prevent the bone uniting.

TREATMENT.

The two plans usually adopted by surgeons for treating this form of fracture are:—

1. By adapting an outside gutta-percha or poro-plastic splint with a four-tailed bandage ; this has been described by a prominent dental surgeon as an admirable method of perpetuating the deformity.

2. By drilling through the fragments, and wiring them together with silver wires. This is to my mind very bad surgery, as it largely increases the inflammation, and, as a result the fragments soon become loose again ; whereas in most instances, they could invariably be kept more firmly in place by some interdental splint with less pain and discomfort to the patient. Interdental splints are not by any means a new invention, as Kingsley says that Chopart & Desault used them and recommended their use as far back as 1780. They were nearly always used in conjunction with the submental clamp, which is rarely used at the present time.

Gunning was the first to use vulcanized rubber for making splints for fractured jaws. The splint that goes under his name is the best for the purpose of treating edentulous cases and cases where the teeth are not sufficient to support a splint fixed only to them, and cases where the fracture is behind the

teeth. It is composed of vulcanite plates for the upper and lower jaws, capping the teeth if any, and connected together by means of blocks of vulcanite in the molar region, leaving a space in the front of the mouth, through which nourishment, mostly liquid, may be taken. Gunning, if there were any teeth standing, used to fix it by passing screws through the plate into holes drilled in the enamel of the teeth.

But now in the days of conservative dentistry, this is not done, but a four-tailed bandage is applied to the patient's chin, thus steadying the jaws without spoiling the teeth. The way it is made is, that models are taken of the injured, and of the perfect jaw as well. The model of the injured jaw is then reconstructed, by sawing through the line of fracture, and if there are any teeth, placing the two halves together, correcting the displacement by articulation with the teeth of the perfect jaw ; it is then sunk in plaster of paris in the adjusted position. If it is an edentulous case the model has to be corrected by judgment. A plate is then made up in wax and tried in. If correct, the wax plate of the other jaw is fitted in, and the articulation taken by getting the patient to bite on a piece of softened wax. If the patient was wearing artificial teeth previous to the accident, the model may be corrected by them. A very good modified Gunning splint may be made by cutting off the front teeth on the patient's artificial set and fixing the molars together by vulcanizing or other methods. Some advise that this splint would be more easily constructed by making the two plates separately first, and then fixing them together afterwards, but I find if the lower is made up rather thickly in wax and a small block put in the centre of the opening for the passage of food, the splint is then sunk in a flask in such a manner that the lower is covered up, leaving only the superior surface of the upper exposed, so that when it is reversed, the surface of the reverse will be like the palate of the upper model. When the wax is washed away, it will be found easy to pack the front of the lower through the hole where the column of wax was left, and when it is vulcanized this column can be cut away. In simple cases of fracture of the upper jaw, a splint such as Kingsley has suggested is generally all that is needed. It is a narrow band of vulcanite running across the back of the palate and round the external surface of the alveolar process to the place of fracture where the ends of the vulcanite bands have little hooks, which can be ligatured together with silk or wire, or a splint capping all the

teeth with arms projecting out of the mouth, fixed to a skull cap by bandages. I believe that it was with a splint like the above that Messrs. Ackery & Paterson very successfully treated a most extraordinary fracture, which they reported to the Odontological Society last year. The whole upper jaw had been knocked entirely out of anything like its right position.

Numerous splints have been devised for the lower jaw, which can also be applied to the upper, of which I shall describe the following as being the most serviceable. Hammond's, Mackrell's, Suersen's, and Hayward's.

Hammond's splint is the cleanliest and the most generally used at the present day for fractures in either the upper or lower jaw, where there are sufficient firm teeth standing on each side of the fracture, to which it may be attached. It was made by Hammond of soft iron wire bent to fit round the lingual and labial surfaces of the teeth, and the ends soldered together with soft solder. It is, of course, made to a reconstructed model. It is placed in position and fixed by passing loops of iron binding wire round each tooth separately, including both sides of the splint, and twisted together on the outside. The wires are most easily passed above the splint in front, between the teeth, below the splint behind, bent up over it, back between the teeth and under the splint in front. I have found in one instance, the only one in which I have tried it, that it was easier to place the splint in the mouth just along the top of the teeth, but not in its proper position, and to pass the wires between the teeth over the splint behind bent round between the teeth and over the splint in front. When all the teeth are wired, the splint is placed in its proper position and the ligatures tightened. This way is not, I should say always practicable, but when possible it obviates that task, unpleasant to the patient, and tedious to the operator, of passing the ligatures between the teeth, and under the splint behind, and as often as not through a piece of mucous membrane. The splint is nowadays made of various metals, such as tinned iron wire, platinum or gold, German silver has been advocated, but owing to the quantity of brass in its composition it is irritating to an open wound. I have found it easier to make the splint in two pieces, one for the lingual, and one for the labial surfaces, the ends of the two pieces are flattened and joined on the labial surface of the last tooth on each side, by soldering with an appropriate solder. The ligatures

generally used are very thin tinned iron wire, and where possible, two or three pieces twisted together to give a better purchase. A quick and easy way of twisting the wire evenly is to fix the ends of the pieces of wire to a chuck of a lathe, and work the lathe, holding the free ends firmly in your hands until twisted sufficiently tightly.

Mr. Mackrell has made a modified Hammond splint, which is a great improvement on the plain wire one. It is made partly of vulcanite, and partly of platinum. He makes a plate of vulcanite fitting the gum and the backs of the teeth, attached to which is a band of platinum fitted to the anterior surface of the teeth. Two or three pieces of wire are fixed on the vulcanite plate and passed between the teeth or spaces where teeth have been extracted, projecting far enough to attach the metal band by means of small nuts or pieces of gold spring screwed on. The reason the metal band is not vulcanised in the plate of vulcanite is, so that if the teeth are thicker in the model than natural, the band may be more closely adapted to the teeth by tightening the nuts. There are holes drilled through the vulcanite plate and metal band at the interspaces of the teeth through which wire ligatures may be passed between them. Sometimes Mr. Mackrell uses his splint without the metal band in front, in cases where no teeth have been extracted, and the teeth are too close together to be able to pass the little rods for attaching the bands between them. He ligatures the teeth to the vulcanite plate only, and he finds that it does exceedingly well. The reason the last splint is such an improvement on Hammond's is that there is a broad plate of vulcanite accurately fitting the gums and backs of the teeth, and therefore, the fragments can be held perfectly firm, and a person with a fractured jaw, to which one of these splints has been adjusted, can masticate his ordinary food with almost as much comfort as if his jaw were intact.

A Seursen splint is like a Hammond's made in vulcanite, only of course much thicker and broader, in order to get the necessary strength. It goes all round the teeth, but not capping them. It may be made so that the wound is quite free for the purpose of dressing it; this is arranged by making the splint of two pieces of vulcanite fitting round the teeth on each side of the fracture, and there joined with a piece of stout wire vulcanized in. This splint is held in position with ligatures like Hammond's. There are holes drilled

through the splint at the interspaces of the teeth through which ligatures of wire are passed.

Hayward's splint is made to cap all the teeth of the fractured jaw and having a rod of stout wire at each angle of the mouth, projecting forwards and outwards and then backwards. It is fixed in the mouth by a bandage passing from rod to rod under the chin, or over the head, according to which jaw it is applied. Hayward originally made it in metal, and affixed it only to the lower jaw, but it is now made of metal or vulcanite and applied to either jaw. The objection to this splint is that the rods projecting from the mouth, cause constant dribbling of saliva, and this causes excoriation of the lips to the discomfort of the patient. There is this advantage in the use of this splint, viz., that it can be fixed to an edentulous case without the aid of the other jaw, and therefore allows a certain amount of mastication.

A curious incident occurred with regard to a splint that my cousin, Mr. H. G. Read, made for a case in which the alveolar process supporting the six front teeth was fractured horizontally, it was only connected to the basilar portion by the soft tissues, being readily movable by the tongue. It was treated by a splint of vulcanite fitting the gums where the molars and bicuspid had been lost, and behind the backs of the front teeth with a wire in front, lined with Truman's gutta-percha. This proved so comfortable and useful for mastication, that the patient refused to give it up when cured, and, I believe, wears it to this day.

THE SURGERY OF CLEFT PALATE.

By B. M. RICKETTS, M.D., Cincinnati, O.

It occurs to me that simple or compound clefts of the palate, either of soft or hard tissues, whether traumatic or otherwise, are the most interesting of all the oral deformities coming within the domain of the dental surgeon. That these conditions are overcome with great difficulty there can be no question.

That the dentist's skill has deprived many a surgeon of a fee there can be no doubt. But now, that the relation of the

two, together with the advance of artistic skill, especially in grafting and transplanting skin, mucous membrane and bone, has become so intimate, we cannot feel but that the dentist's work is secondary at least in the majority of cases.

To make the mouth and its anatomical relations the subject for our text, and to review their various deformities by any cause whatever, would make my paper and reports connected therewith voluminous. Indeed too much so, for the recent work in this line has been so great that the slightest review of the literature pertaining to it would consume too much of the time tended for others.

In consequence thereof, I will confine my remarks to the "Surgery of Cleft Palate" with a few suggestions concerning the buccal and labial regions, especially with reference to restoration by grafting. It is difficult to determine just where the work of the dentist ends and where that of the surgeon begins. However, I do not think that either would be more content than the other to have this work reported in a journal on mechanics.

Any part or all of the hard palate may be wanting with or without its soft mucous covering. However, as a rule, when the hard palate is absent in part or in toto the mucous membrane is also wanting, especially is this so when the perpendicular plate of the ethmoid is absent as is frequently the case. When the soft part alone is involved the rent may be in any direction or to any degree, or it may be absent entirely.

Where the deformity of the hard palate is due to injury the difficulty of restoration is not so great, as the requisite amount of tissue is, as a rule, present, and even in many cases of congenital cleft the proper amount of bone tissue is present, but the edges are inverted so as to pretty well occupy the nasal fossa. In such a condition as this, that portion of the rolled border may be divided by a saw or forceps, then brought down and sutured in normal proximity by means of silver wire, mounted first by a coil and then by a perforated shot well compressed.

TIME FOR OPERATION.—This is of first importance and should not be left unnoticed, at this point of our remarks, for many times the success of the operation depends almost entirely upon the age of the patient at the time of operation. We take it for granted that all the cases due to traumatism should be operated upon immediately or as soon after the injury as it is possible. In congenital clefts the most desirable time is within the first weeks.

Mr. Marcy was the first to make a trachæotomy so that the patient might respire while the oral cavity was closed, so that primary union might be secured in a cleft of the soft parts. Although this proved successful and the patient recovered with practically a normal palate, the propriety of such a procedure is to be questioned so long as results are secured by other means that answer all practical purposes. True, Mr. Marcy has shown us what can be done, but not why it should be done.

To Thos. H. Manley is due more credit than any American for carrying into use the suggestions of Maurice Collis, of Dublin. In congenital clefts, Mr. Collis says, that the intermaxillary segment may be crowded back into position by fracturing the maxillaries. If the septum refuses to yield a wedge it should be removed at the point of junction of the vomer with the ethmoid. The tuft always contains four teeth, the central and lateral incisors. It is upon this that the shape of the mouth depends. The wide deviation of the opposing jaws would render the remaining teeth useless so far as mastication is concerned.

By resorting to the foregoing operation, not only is the shape of the mouth retained or rather restored, but the lateral and central incisors are preserved. It may be necessary to chisel away a portion of the adjacent osseous tissue that close proximity of the parts may be accomplished and union secured. In either event the use of silver wire is indispensable and should be used with great care. I have done this operation three times, with most gratifying results in two of them. The other failing to unite, sloughed and was lost. The only modification that I offer is in the plan of making taut the wire, which is done by a simple coil of wire mounted by a shot through which a hole has been drilled.

This child was injured about one hundred and sixty miles from this city, and was operated upon within twenty-three hours from the time of injury and remained in the house about three weeks. There are few general practitioners or surgeons and still fewer dentists who are not familiar with the deformities due to any cause whatever. As to the cause of these clefts there are many interesting features, it undoubtedly takes place sometime within the first six or eight weeks of foetal life, though what the cause is we are not able at present to determine definitely, however, those who have been investigating the subject and paying the most attention

to it assure us that it is sometime within the first eight weeks of foetal life. Mr. Ferguson has made some very interesting observations, all of which would require more time than I can give just now. Now, in order that you may better understand these deformities, and understand what I have to say, and the few suggestions I may offer, I have, with the assistance of an artist, placed on the charts for you these diagrams that we may take them up in regular order, giving you the the most common deformities of the hard parts. We have not the time to enter into any special classification other than to classify the procedure of the correction of these deformities as surgical and mechanical.

It is rather remarkable that the majority of clefts are in the female, perhaps 70 per cent. ; some authors claim that those persons having cleft palates are sterile, especially women, and others that it is so with men, but we have all known women who have become mothers, and we have all known such men whom we had every reason to believe were fathers.

Now the most common of these deformities are those where the tuft projects with 1, 2, 3, or 4 incisors, but I have seen cases that show the fallibility of Mr. Collis' rule that the tuft always contains four incisors. I operated upon one of the cases thirteen months ago, the child at the time of operation being five weeks old. I lost the tuft with all my efforts to save it, perhaps it was due to its pedicle being so small that it was not properly nourished. Mr. Collis' operation was the one that should have been made, as the septum could have been divided without any difficulty, and if necessary, the edges pared and forced upon the sides of the superior maxillary bones, perfect coaptation being secured by means of silver wire. I have made this operation and am sorry that it was not made in this case ; however, the child made a rapid recovery with practically perfect result, and is now alive and of average size for one at that age. One similar case operated upon by Mr. Collis' plan six years ago at the age of five years, is alive and doing as well as though the operation had not been required.

When the septum extends to the alveolar process, the tuft extending beyond this with one or more incisors, it is almost impossible to save the teeth, especially if the septum is attached at the alveolar process ; however, as we are not able always to determine what the result will be, it is our duty to give the subject the benefit of every doubt, but if in

a few years these teeth are inefficient and are not capable of prehension or mastication, then it is time to take them out. The absorption of the process may be partial or complete.

The dentists have been doing such excellent work, that we are many times in doubt as to whether or not deformities of the cleft palate should be taken out of their hands, so far as mechanical restoration is concerned. Dr. Grant Mollyneaux, a resident of our city and one of your number, has done more than any of your American brethren in a mechanical way to relieve these deformities. It being necessary that the air passages should be lined with epithelium great difficulty has often been encountered in restoring the soft palate with flaps from the cheek or forehead, one operator has suggested and performed the following operation three times, each time failing, while another operator, of more recent date, had operated once with success. The operation consists in laying the nose entire to either side by a free incision denuding the frontal bone of its integument and periosteum, twisting it upon itself so that the pedicle would not be too tightly compressed crowding it into the nasal cavity, sutured with wire in such a way as to bring the cutaneous surface on the upper side forming the floor of the nasal fossa, while the periosteum forms the roof of the mouth. The success of the last operator was undoubtedly due to the fact that he carried with the integument the periosteum. I would not feel justified in placing this operation before you for serious consideration with our present knowledge of these cases and our means of correcting their deformities.

As to the time of operation I think it is conceded that these operations should be made in the first few days of infant life, there are cases where the conditions are such that this may be questioned. Sometimes when we take a child three or four days of age and insert the silver wire or silk worm-gut or even silk or cat-gut, the tissues are so soft that they pull out. But I think the only thing to do is to again give the patient the benefit of the doubt, and while there may be doubt as to its recovery, in the majority of cases it is correct. If they should die we feel that there is not the loss that there would be in allowing the child to reach adult life and assume the responsibilities of such life. Then there are children that fall heirs to property and there are conditions from a medico-legal standpoint, either of which have reasons within themselves of the child living. You all know that

there are marriages contracted on the basis of raising children to inherit property. Under these circumstances and on this basis it may be necessary to postpone operative procedures until adult life.

The specimen that I present to you is the cranium, showing the palate at ten years of age. The bones are not completely ossified, in fact the palate is almost separate from the palatal process of the superior maxillary bone.

Now, as to the silk worm gut I have referred to, I will say a few words. Like silver it does not become absorbed, it is the substance which composes the angler's pride (fishing string). It is made from the jelly found in the silkworm and is the substance from which the worm spins its silk. It is drawn out in a thread-like manner, treated to a solution of sulphuric acid which hardens it, and put through various other processes, after which it becomes the substance which you now see. Our own silkworm will not supply a string more than five feet long, while the Asiatic worm gives one as much as thirteen feet in length. As to the mode of bringing the edges together, whether of the hard or soft tissues, I have the means here that I think is better than anything that has been presented to the profession. This coil is one prepared by Mr. Armstrong, of Indianapolis, and called the "Aveling Coil," with which some of you are perhaps familiar. It is a secret process, and yet I am given to understand that it is a compound of silver, platinum and aluminum. It may be used in various things and the substance may be allowed to remain in the flesh indefinitely without giving any serious difficulty.

The instrument that I use in the clefts is what is called a Collin's needle, a French instrument imported by me five years ago, and which is now becoming quite common, there are twelve needles accompanying it, varying in shape, so that almost any angle may be obtained. The needle once through the tissue, and being hollow, a silver wire is forced through it by means of a ratchet, pulled out to any desired length, cut off and fastened by one of these coils, and afterwards secured by a perforated shot, the wire being soft silver does not permit of the ratchet running over it but two or three times, so that it is best to use a new wire each time. I did not expect to give you a very lengthy paper, it was merely to bring the subject before you for your consideration, and to give you a thought or two as to what is being done in this line by the every day surgeon, at least by those who pay any special

attention to these kind of deformities. I am satisfied that we have in the operation described by Maurice Collis a very effectual means of correcting certain deformities and I shall give it a trial, I hope at a very early date. I should be glad indeed to get the expression of the various members of this society and to hear their criticisms and get whatever views that they may have to offer, or suggestions, or what may enable us to get out of the difficulty which we so often encounter in correcting these terrible deformities.

At the age of 5, while sitting in a high chair blowing a tin whistle six or eight inches in length, fell forward to the floor. The tip of the whistle struck just behind the upper incisors, plowing backward, pulling off the hard palate until the line of union of soft and hard palate was reached, when it was forced up through the soft palate into the post nasal chamber, cutting and tearing its way until the posterior wall of the nasal pharynx stopped its progress. Upon examination a Y shaped laceration was to be seen pointing forward. The hard palate was found to be penetrated and laceration of soft parts quite severe. All food taken passed upward into the nasal chamber, the liquid portion coming out forward, but the greater portion of the solid food remained in the nasal cavity and soon gave rise to a nasty, foul odour depending upon the subsequent decomposition of it. Chloroform was used as an anæsthetic, and silver wire was used as sutures. Considerable difficulty was experienced in finding a needle of proper cure to engage the flaps, as the arch of the hard palate was unusually high. I was finally successful; however, I lost two stitches by sloughing and a second operation was necessary, which gave perfect relief to the child and ended in a perfect cure. Why this tin whistle did not completely detach the bone I am unable to say.

IMPRESSION-TRAY EXTENSION.—Take a strip of thin sheet lead or tin and shape it to fit the rear floor and come around on the sides of the tray, passing backward and standing as high as desired. Drill holes through the strip and tray, and sew them together. The plaster will thus be prevented from overflow into the fauces. By simply cutting the threads the tray may be restored to its original form and be ready for another like modification to meet any peculiar case.

British Journal of Dental Science.

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A "TEACHING UNIVERSITY AND THE TEACHING OF DENTISTRY."

So the scheme for the reconstruction of the University of London, which for so long has been debated and redebated, has received its *coup de grace*. It is not much use wasting words in giving details of a moribund idea ; but as two alternative schemes have been advocated and as only the one is, as yet, definitely disposed of, it may be as well in a few words to place the two side by side. The first, which is now dead, was to merge the present University of London and the Royal Colleges of Physicians and of Surgeons into one degree granting body, on the governing council of which representatives of both metropolitan and provincial teaching centres were to have seats. The second can hardly be said to be formulated, but the intentions of its advocates are generally accepted as being to establish a totally new teaching University, leaving the present University of London to continue its rôle of Imperial examiner and degree granter. We need hardly recall the various elements which have been the main-spring in the agitation for some reform in the system of higher education and diploma granting now in force in London. From the educational point of view, the waste occasioned by the present disconnected efforts of the various metropolitan schools, medical and otherwise, is sufficient reason for a serious overhauling, at any rate, of the present system. Though whether this would or would not lead to any very radical cure

is another matter. It is from this educational standpoint that we, Dental Surgeons, are most concerned with the movement. As is well known the dissatisfaction with the examinations, and degrees obtained thereby, is almost solely felt by medical students, who are not graduates of the University of London. The chief point being that though their education may be equal, or superior, to that of the students at Scotch or Irish Colleges, they are not able to obtain the right to the use of the title Doctor, whilst the latter do. It is a very real grievance, but one dentists, even though they take the medical degree, can hardly feel. We do not claim to be a speciality of Medicine, but of Surgery, and so, at any rate in this country, we should, and the majority do, follow the latter in remaining plain "Misters." This, however, is by the way, for the point we specially wish, at present, to bring forward, with a view to eliciting discussion, is whether the teaching of dentistry would derive any benefit by the establishment of a Teaching University. We are perfectly free to confess that till we have a definite plan put before us as to what this scheme is, we cannot discuss it very seriously; nevertheless, there remains the question, whether or no dental surgery should seek to ally itself to such a University? Whether the present system of teaching in different schools is advantageous, or whether the theoretical side were better taken at some common centre, though the practical part of a student's training, will and must be taken at the different Dental Hospitals? We certainly should be desirous of seeing Dental Surgery taking rank with the specialties and subjects which would form the matter for lectureships, professorships and so on, and if we desire it, if the profession desires it, the request must be put forward in early days, ere the scheme be definitely drafted. Undoubtedly the whole question is very much wrapped up with that of "General *versus* Special Hospitals?" Are special subjects taught better in special hospitals than they are in general hospitals? We fancy the majority indeed ally Dental Surgeons would say that at any rate our speciality most undoubtedly is. Indeed the one metropolitan general hospital, which has sought lately to efficiently carry out

Dental instruction in its walls, has had to organize what practically becomes a special hospital. The upholders of special hospitals and schools urge that specialism receives more liberal treatment in these institutions than they do at the hands of those interested in what is called general practice. In the same way it might be urged that a professor attached to a large University would not have as free a hand, or would be so liberally supported, as he would were he a member attached to a school specially devoted to teaching that subject. We must, however, remember that if there were one teacher of a subject instead of several, it would possibly be made more worth his while to devote himself more exclusively to his teaching. But even supposing the matter were better handled at such a University, two very weighty "contras" are met. In the first place, London differs from any other English city in its great size, if a student have to attend lectures in one place, general hospital practice in a second, and special hospital work in a third, the waste of time would be simply enormous, whilst the needs of the poor render any centralization of the hospitals most undesirable. In the second place, "the best way to learn is to teach," and therefore the more teaching appointments there are, the greater number of men there will be who are actively learning, actively working out unsolved problems, actively advancing the work of the Profession. The limits of our article render any fuller treatment of the question impossible at the present moment, but we hope we have said enough to show not only that the question is a most important one in its relations to our Profession, but also a most intricate one, one that needs looking at from all sides, each point needing careful consideration before any final opinion be reached.

THE following preliminary report of the standing committee of Hypnotism, of the Medico-Legal Society of the United States, may interest some:—

"The literature of the subject is growing opulent—a thousand

titles are now recorded. The number of reputable investigators increases. Taken out of the hands of those whose aims and methods cast discredit on it, hypnotism is studied by members of each of the learned professions, vitally related as it is to the interests of which they are the natural custodians. It is safe to say that these facts are established :

1. Hypnosis, or artificial trance-sleep, is a subjective phenomenon. Here modern science joins issue with old-time mesmerism, the theory of some mysterious efflux from the operator. Hypnosis may be self-induced through expectation alone, through fright, by religious ecstasy or any enrapturing emotion.

2. Hypnosis is not in itself a disease. Neurotic conditions predispose one to the trance-sleep, but the strongest minds have also been enthralled. Their recorded visions have been an open book for centuries.

3. Hypnosis is recognized in three stages—lethargy, somnambulism and catalepsy. The transition may be immediate. The second is instantly induced in trained sensitives.

4. Hypnotism has been serviceable in medical and surgical practice, both as a therapeutic agent and in some cases as an efficient and safe anæsthetic.

5. The illusory impressions created by hypnosis may be made to dominate and tyrannize the subsequent actions of the subject. The following legal aspects present themselves :

1. Has the sensitive sought the operator, or has the operator used undue influence to gain control of him?

2. Are proper witnesses present? 3. Are possible elements of error eliminated, such as self-deception, simulation and malingering? 4. Is hypnosis a justifiable inquisitorial agent?

5. Do we need a reconstruction of the laws of evidence in view of the perversion—visual and otherwise—created by the trance? 6. Is any revision of the Penal Code desirable in view of these facts? Finally, should there be legal surveillance over private experiments or public exhibitions?

The committee will welcome suggestions on these or on other points, and any instructions as to methods of investigation of the matter referred to them by the Society."

The International Journal publishes an interesting article on the new Tariff on Manufactured teeth which the McKinley bill imposes on all such teeth entering the United States. We gather from it that though teeth were specially mentioned in the old law of 1883 and twenty per cent. *ad-valorem* duty imposed, under the new act they come under the general classification —“China, porcelain, parian etc. . . . if not ornamented or decorated,” the duty being fifty-five per centum *ad valorem*. This Journal proceeds :—“Now, it may be asked, why this increase of duty? Is the industry one that requires protection? Have the gentlemen who have been engaged in this manufacture for the past half century not realized an equivalent for the capital invested? Have they at any time been in competition with the cheap labour of Europe? These questions, and more, require answers from those financially interested. We have no information to lead to the supposition that undue influence has been used to secure this additional charge; but it is singular that the Committee of Congress should have decided to increase the duty thirty-five per cent. without solicitation or knowledge. It would be interesting to know the reasons for this great increase.” It occurs to us that as teeth are not specially mentioned but are included in a general group, the increase in duty is only in keeping with the increase generally and not intended to specially protect American teeth manufacturers. The demand for the English made tooth for certain kinds of work, and the prospect of their not being obtainable seems likely to prove inconvenient to the dental practitioners in the States. We may therefore expect some efforts to get teeth exempted from the general working of the clause. The more so as in the opinion of Americans the branch of industry in the States “has occupied a pre-eminent place in the work of the world, and has never stood in danger of competition.” “They that are whole need not a physician but they that are sick.”

THE following appears in a recent issue of the *British Medical* :—

FREE ATTENDANCE ON DENTISTS.

M.D. asks :—Is it customary for medical men to attend dentists, their wives and families gratis, and *vice versa*. In this town there are two dentists, father and son, each with families, every member of which expects me to attend them without fee, confinements included. On the other hand, the dentist neither charges me nor my wife, in spite of my protests. I need hardly say the two dentists have very much the better of their self-determined bargain.

* * The principle involved in the “self-determined bargain” above referred to is, we have reason to believe, a modern innovation. Although the supervision of the dental profession is now vested in the General Medical Council, and thus officially recognized, yet such recognition does not entitle dentists as a right to gratuitous medical attendance for themselves and families. Under any circumstances, some limitation to such an assumed claim upon the family doctor is desirable. We are not aware that there is any generally recognised rule upon the point.

We do not wish to comment on this individual case, but we would add to the Editor of the *British Medical's* remarks :—Neither does it entitle medical men as a right to gratuitous dental attendance for themselves and families. We fancy that as a rule the dentist gets the worst of the bargains whether “self-determined” or otherwise, and we would only say that it seems to us far more just that both should pay a modified fee. We are sure it is far better to do so rather than to make a boast of never charging medical men, and then putting in amalgam where gold should be “because I could not afford the time.”

CEMENT WHICH RESISTS ACIDS.—Melt together carefully one part of caoutchouc (India-rubber) with two parts of linseed oil, and gradually incorporate with it three parts of white bole, so as to form a plastic mass. This cement is not at all attacked by hydrochloric, and but very little by nitric acid. When heated it softens but very little. It does not easily dry upon the surface. If this cement is mixed with one-fifth of its weight of litharge or minium, it dries up in the course of time and becomes hard. This is known as Benick's cement.—*New Remedies*.

Reflections from the Surgery.

A CASE OF FRACTURED INFERIOR MAXILLA.

By W. FRYER CORNELIUS, L.D.S., Eng.
Dental Surgeon to the Teignmouth Infirmary.

ON January 14th, 1891, John T—, æt. fifty-five, whilst at work on the quay at Teignmouth, was accidentally struck in the face by a log of wood in a crane, and sustained, in addition to severe bruises, a fracture of the lower jaw at the symphysis. He went to the Infirmary, where his injuries were attended to by the house surgeon, who reduced the fracture and put on a gutta-percha splint. About four weeks afterwards, my colleague, Dr. Piggott, examined the case and ascertained that no union had taken place, and called my attention to it. I suggested a Hammond splint, for which it was a typical case. Impressions were taken, and the deformity corrected by sawing through the line of fracture and re-articulating with model reduction of the upper jaw. An iron wire splint was then made to the corrected lower model, ether administered to the patient, the fracture reduced and splint applied, although with great difficulty on account of the time which had elapsed since the accident, which was still further increased by a rather loose incisor, which had finally to be extracted before the splint could be slipped into position over the teeth. The splint was removed in eight weeks, the parts being restored to their normal position.

The point of interest about this case I think is, the good result obtained by the use of a wire splint after the fracture had remained practically unreduced for four weeks and a half, which satisfactory result was probably not delayed but rather advanced by the friction on the fractured ends of the bone during the difficult reduction of the fracture, and fixing of splint referred to above.

SOAPING RUBBER-DAM.—When teeth are very close, a little soap on the rubber-dam will prevent its being torn and save so much time and annoyance that the expedient should be often mentioned for the benefit of the possibly few who do not already know it.

Abstracts of British & Foreign Journals.

THE FRENCH DENTAL JOURNALS.

LAWS IN THE PRACTICE OF MEDICINE IN FRANCE.

The French Chamber of Deputies has recently been engaged in discussing the above proposed law, and the *L'Odontologie* for March publishes in full the discussion on these Clauses which affect the dental profession, viz. Clauses 5 and 6. Clause 5 reads thus : "The practice of the profession of dentistry is forbidden to everybody not possessing the diploma of doctor of medicine, officer of health, or of dentist granted by the French Government after examinations conducted by a Board of Higher State Medical Education, and after a course of studies laid down by the Higher Council of Public Instruction." Dr. Isambard moved as an amendment the rejection of the entire clause, his arguments being that the profession of dentistry was a free one, and that if it required to be regulated it ought not to be introduced into a law dealing with the practice of medicine. He added, that to be a dentist it was not necessary to be a surgeon, or to have pursued long courses of study in anatomy, physiology or pathology; it was necessary above all things to be a mechanic. Dentistry was much more a matter of mechanical work than of surgical operations. The amendment was opposed by Dr. Brouardel on behalf of the Government on the ground that the advances which the profession had made, and the dangerous drugs which were used in its pursuit called for higher education and greater restrictions, and that it was imprudent to leave it in the hands of the first-comer. On the amendment being put to the vote it was lost; Dr. Isambard then proposed that the word "licence" should be used instead of "diploma" of dentist. This was agreed to, and the clause thus amended was passed.

Clause 6 was then taken. It reads thus :—"The right of practising the profession of dentistry is, by a temporary agreement, granted to every dentist, whatever his nationality, proving by the production of his certificate, that he has been in practice one year before the passing of the present law. In no case in future will dentists have the right to administer

local or general anæsthetics without the assistance of a doctor of medicine." On the first part of the Clause, M. Paul Déroulede move to insert the words "of French nationality" instead of the words "whatever his nationality." After some discussion it was decided to omit both phrases. On the second paragraph, viz., that relating to the administration of anæsthetics, an alternative reading was put forward by the Government, and after some discussion on technical points, was adopted. The whole Clause as thus amended and adopted will therefore read thus :—"The right of practising the profession of dentistry is by a temporary agreement, granted to every dentist, proving by the production of his certificate, that he has been in practice one year before the passing of the present law. This concession does not give, in any case, to dentists in the position indicated in the preceding paragraph, the right of administering anæsthetics."

The Bill, of which the above are the two clauses affecting dentists, has still to go before the Senate, before it is passed into law, and *L'Odontologie* in commenting on the proceedings in the Chamber of Deputies, expresses a strong hope that the Senate may be of a different frame of mind. It speaks bitterly of the short discussion which took place. "The liberty of the dental profession is dead," it says. "A liberty respected by the Empire, the Restoration, the Government of July, even by the second Empire, is destroyed by the Republic, and only one voice, that of Dr. Isambard, is raised to protest against it. Granting the necessity of regulating, we should have wished that the French Government had been as liberal as the English Government when it introduced the Dentists' Act of 1878." It promises to return to the subject in the next issue.

In the same Journal, M. FOULON describes and figures an apparatus for providing hot and cold water, and hot and cold air, under pressure. His apparatus consists of (1) an air pump, (2) a receiver for the compressed air, (3) another receiver, divided into two compartments, one for cold, the other for hot water. Beneath the latter is a space which contains the heating apparatus (which may be either gas or

spirit) and in which are two coiled tubes. The first tube starts from the hot water tank, and serves to heat up the water, and the second one is connected with the compressed air receiver, and serves to heat up the air in the same manner. Two tubes also run from the compressed air receiver into the hot and cold water tanks, thereby putting the water under pressure. Separate tubes run from these different compartments to a central "distributor," which is placed within reach of the operator, and where by means of a ingenious arrangement of the taps, he has at hand a jet of hot or cold water, or hot or cold air, which he can regulate at will. M. Foulon uses it for thoroughly cleaning, and subsequently drying cavities, nerve canals, &c., by means of a fine nozzle as in a syringe. He also uses it to insufflate drugs, such as iodoform. The same apparatus can also be made to work the saliva pump, the pneumatic mallet, the thermocautery, and the ether spray.

M. GODON in bringing forward Mr. Dall's method of fixing artificial teeth by means of a pivot pin passing into a hole in the alveolus, described a case he had himself done, in which he had screwed a hollow platinum screw into the empty socket of an upper bicuspid. In the course of a few days he mounted a Logan crown, the pin being fixed in the platinum tube previously screwed in the bone. The case being quite a recent one, M. Godon could not affirm as to the ultimate success of the operation.

L'Odontologie.

REDDENING OF CARBOLIC ACID.—Krämer and Spelkir have found a new body in coal-tar, which they call indene, $C_9H_4C_2H_2CH_2$. They isolated it from crude benzol as a picrate. They saw that the red coloration of naphtholin when treated with sulphuric acid is due to the formation of indene, and it is probable too that the red coloration of carbolic acid is allied to this. We do not seem to get to the end of the causes for carbolic acid becoming red. The red colour does no harm, it does not lessen the efficiency of the acid, and few pharmacists or physicians think anything about it, yet we are always getting some new explanation. No two chemists agree about the cause, and none have yet shown how to prevent the coloration.

Chemist and Druggist.

ON THE COMPARATIVE RAPIDITY WITH WHICH
DIFFERENT ANTISEPTICS PENETRATE DECAL-
CIFIED DENTINE: OR, WHAT ANTISEPTIC
SHOULD BE USED FOR STERILIZING
CAVITIES BEFORE FILLING.

By W. D. MILLER, M.D., D.D.S., Berlin.

THE practice of superficially washing out cavities of decay before filling with some substance possessing antiseptic properties was carried out by many practitioners long before our views regarding the etiology of dental decay had taken the definite form which they now have. Many years ago a well-known teacher of dentistry remarked to me that he always bathed the cavity with creasote before filling; just why he could not tell, but he had a feeling that it might have a beneficial action,—at least it could do no harm. At present the practice is universal, and the object to be obtained is the devitalization of germs which may not have been removed by the process of excavating.

The developments of the last decade in regard to the etiology of dental decay and to the physiology of the low forms of vegetable life concerned in the causation of it, teach us that this practice is in every way commendable. The fact has been well established that many bacteria possess the power of living and propagating themselves, but also of manifesting their characteristic action under partial or complete exclusion of air, and even that for the existence of certain species of bacteria the exclusion of air is absolutely essential; if, therefore, we leave traces of softened dentine on the walls of our cavities, unless it has been thoroughly sterilized, even an air-tight filling will be no guarantee against the progress of decay in the already softened parts. Most particularly in all cases of acute caries, where the softening has progressed nearly or quite to the pulp and the dentine is completely saturated with moisture and bacteria, if we for any reason do not effect the complete removal of the infected parts, the thorough sterilization must form the basis of all attempts at conservative treatment; otherwise we have no certainty that decomposition may not take place under the filling, leading to exposure or septic inflammation of the pulp.

I think, however, that the facts are pretty generally recog-

nised by the profession, so that with the mere statement of them we may at once proceed to the question, With which material can we best effect the desired purpose?

In this matter more unity of practice exists than in the treatment of root-capping of exposed pulps, &c., the vast majority of dental practioners being in the habit of bathing the cavity before filling with concentrated carbolic acid.

No attempt, however, has been made, as far as I know, either clinically or experimentally to determine the relative sterilizing power of various antiseptics upon carious dentine, or, in other words, which of the various antiseptics at our disposal are best adapted to the purpose and how much time they require. There are several ways in which the question may be approached experimentally, some of which I will briefly describe.

METHODS OF EXPERIMENTATION.

I.

A number of freshly extracted teeth with cavities containing large quantites of softened dentine are washed in water and placed in a vessel holding a sufficient amount of the antiseptic to completely cover them. Here they are allowed to remain from half an hour to one and a half or even two hours, according to the known power of the antiseptic. They are then removed with a pair of sterilized pliers, thoroughly rinsed in alcohol, which of course must be free from germs, and then again in sterilized water, the object being to entirely remove the antiseptic from the surface of the tooth. The teeth having been dried with sterilized bibulous paper, the roots are wound about with sterilized paper so that they may be held between the fingers without coming in contact with the crown. Having then some half-dozen thoroughly sterilized spoon-shaped excavators at hand, we remove the carious dentine layer after layer till we reach the bottom of the cavity, or we may succeed in peeling out the whole of the decayed dentine in one piece, care being taken not to let the instrument come into contact with the dentine at the bottom of the cavity. Of the latter a small piece is chipped out with a fine excavator and carefully conveyed to a plate of agar-agar. In like manner a second piece is put into a tube of bouillon. If now the piece of dentine becomes surrounded by a growth of micro-organisms, or if the bouillon becomes clouded, we know that the antiseptic had not com-

pletely sterilized the whole mass of the dentine. If, on the other hand, no growth takes place either in the bouillon or on the agar-agar, we are justified in concluding that the whole mass of the dentine had become permeated and sterilized.*

This experiment requires great care, and can only be carried out by one who has had considerable experience in bacteriological work and understands how to avoid the many errors of experiment which are so liable to occur in this manipulation.

The results obtained by this method will be given in detail below. I wish only to remark in this connection that living bacteria may sometimes be found in teeth which have laid for one and three-quarters hours in concentrated carbolic acid, and that my earliest observations in regard to this matter, reported in the *Dental Cosmos* for January, 1881, are in complete accordance with the facts.

II.

The power of antiseptics to permeate decalcified dentine may also be determined by aid of the following apparatus. A small glass vessel was cut in two, and the cut edges of the two halves ground so as to fit accurately together. A section of softened dentine from an elephant's tusk was then inserted between the two halves, and the latter pressed together by means of a small screw frame. Two-thirds of one half of the glass vessel was filled with the antiseptic, the other half to an equal amount with an infected solution of bouillon, and the time determined which elapsed until a sufficient amount of the antiseptic had passed through the ivory partition from the former to sterilize the contents of the latter.

III.

Small glass vessels are filled with the antiseptic to be tested, and covered with plates of decalcified ivory of equal thickness. Upon these plates are laid a number of small pieces of decalcified ivory or dentine. As soon as the antiseptic passes through the plate of ivory in sufficient quantity to act upon the small piece of dentine, the latter itself acquires an antiseptic action and consequently inhibits the growth of bacteria in its neighbourhood when it is placed on a plate of gelatine

* This statement would suffer a restriction if it should be found that the deep parts of decayed dentine contain non-cultivable bacteria.

or agar-agar. We accordingly take the small pieces of ivory from each vessel, one at a time, at intervals of about ten minutes, and put them upon a plate of infected gelatine or agar-agar. Any antiseptic action which the pieces may have acquired will be shown by the presence of a transparent zone around them after the plate has been kept from one to two days.

IV.

A tube of gelatine is richly inoculated with a mouth-bacterium which grows rapidly at room temperature without liquefying the gelatine, and then poured upon a glass plate after the usual manner of making plate cultures. As soon as the gelatine has become thoroughly stiffened, a large plate of decalcified ivory, which must be entirely free from acid, is placed upon it; any air bubbles which may become inclosed must be got rid of. Upon this plate we place a number of pledgets of cotton saturated with various antiseptics, and cover up the plate with a bell-jar or an ordinary glass cover, kept moist on the inside by a lining of wet bibulous paper (to prevent the warping of the plate of ivory). After any determined time, carefully peel off the ivory plate from the gelatine and put the latter away in a moist chamber. In twenty-four to forty-eight hours the plate will be densely clouded except at those points where the antiseptics from the pledgets of cotton have passed through the plate of ivory in sufficient quantity to prevent the growth of the micro-organisms in the gelatine; these points will be marked by a circle of transparent gelatine.

I have found this method to be the simplest and most easy of carrying out; it should not, however, be relied upon alone, but should always be controlled or checked by parallel experiments by the other methods, particularly by method I.

There are still other ways of carrying out these experiments, some of which I have also made use of, but those already given will suffice, I think, to show the principles involved.

RESULTS.

One general result of these experiments already referred to above is the establishment of the fact that the thorough sterilization of decayed dentine requires more time and care than we are accustomed to bestow upon it.

If we wish to be sure that we have completely sterilized a layer of dentine 1 mm. thick with carbolic acid, for example, we must allow the solution to act at least three-quarters of an hour ; nor does it suffice simply to moisten the surface with the acid ; the whole cavity must be thoroughly bathed with it. Simply wiping out a cavity with carbolic acid and immediately drying it, gives no guarantee whatever that any softened dentine present has become sterile.

Up to the present time I have tested the following materials : 1, chloride of zinc ; 2, five per cent. solution of bichloride of mercury ; 3, five per cent. solution of trichloride of iodine ; 4, five per cent. solution of pentachloride of phosphorus ; 5, double chloride of gold and sodium ; 6, double chloride of potassium and platinum ; 7, trichlorophenol ; 8, carbolic acid ; 9, lysol ; 10, peroxide of hydrogen ; 11, oil of cinnamon ; 12, oil of cloves ; 13, oil of peppermint ; 14, oil of wintergreen ; 15, pyoktanin ; 16, resorcin, ten per cent. solution ; 17, benzoic acid, ten per cent. alcoholic solution ; 18, absolute alcohol ; 19, thymol, twenty per cent. alcoholic solution. Of those substances just mentioned which have not been used in dental surgery, or received notice in the dental periodicals, I wish to call particular attention to the

Trichloride of Iodine.

This preparation was recommended as an antiseptic by Riedel and Langenbuch in 1887. It is a brick-red powder which has an irritating smell of chlorine. It may be had in quantities of ten grammes in hermetically sealed tubes, and is best kept in five per cent. aqueous solutions, which appear to remain unchanged indefinitely, or at least for some months though I have sometimes noticed a slight increase in the acidity of the solution. Langenbuch claims that a 0.1 to 0.15 per cent. solution is equal in antiseptic action to a 0.5 to 1.0 per cent. solution of bichloride of mercury ; in other words, that it is about five times as efficient as the bichloride. The five per cent. solution has but slight escharotic effects when compared with concentrated carbolic acid.

In order to compare the two, I put a drop of carbolic acid upon my arm and near it a drop of five per cent. solution of trichloride of iodine ; the result, as expected, was a disagreeable wound produced by the carbolic acid, but not a trace of any action on the part of the trichloride.

It is also claimed by prominent authorities to be *relatively* the least poisonous of all antiseptics. Behring found that *in aqueous solutions, having equal action upon the spores of anthrax bacilli*, sublimate is five to six times, and carbolic acid and creosote seven to eight times, as poisonous as the trichloride.

We have consequently reasons to hope that the trichloride of iodine may prove a valuable remedy in the treatment of diseased conditions of the teeth and mouth. I have begun to use it in the clinic of the dental institute, and shall report the results in connection with experiments which are being carried on in the laboratory.

Its efficiency as a disinfectant for carious dentine was tested six times by the first method and thirty-five times by the fourth. The results obtained by the latter method were exceedingly good. The first method also gave good results, though not quite so striking as those obtained by the fourth. The impression gained on the whole was that the five per cent. solution of the trichloride of iodine is one of the most active agents at our demand for effecting the purpose in question.

I will not fail, however, to call attention to the fact that this solution has a distinctly acid reaction which must be taken into consideration in attempting to put a proper estimate upon the value of any substance to be used upon the teeth.

The Bichloride of Mercury,

which usually ranks as the king among antiseptics, was tested by each of the four methods, in all sixty-three times, with uniformly good results, although particularly in method IV it fell considerably short of the striking action shown by the trichloride of iodine.

The pre-eminent position held by the chlorides among the antiseptics suggested the thought that other chlorides, containing a still higher number of atoms of chlorine, might have a still more powerful action. I was accordingly led to make a test of the *pentachloride of phosphorous*, which, tested by method IV, proved to have a penetrating action superior to that of the bichloride of mercury, but not, however, equal to that of the trichloride of iodine. This fact is interesting chiefly from a theoretical stand-point, since the intense acid reaction of the pentachloride renders it unfit for use in the mouth.

The Peroxide of Hydrogen.

was tested thirteen times by method I, and fourteen times by method IV. The results obtained by the two methods were strikingly at variance with each other : tested by method IV, it appeared to be one of the *most* active of the substances employed, whereas the first method showed it to be one of the *least* active. Two possible ways suggest themselves for accounting for this discrepancy. Either the products of decomposition present in the superficial layers of the decayed dentine disengage the atom of oxygen, which then escapes, leaving only the remaining portion of the molecule (*i. e.* water to act upon the deeper portions of the dentine, the result being that while the superficial layers are speedily sterilized, the deeper ones are reached only by the inert water ; or, secondly, we may suppose that the bacterium made use of in the fourth method is peculiarly sensitive to nascent oxygen, hence the striking action of the peroxide. I rather incline to think, however, that the first explanation suggested is the proper one, and that the peroxide, while an excellent sterilizer for thin layers, fails when applied to thicker ones.

Carbolic Acid

was tested fifty-nine times ; fifteen times by the first method, twice by the second, twice by the third, and forty times by the fourth. The results obtained harmonized pretty well throughout, and showed that while the carbolic acid is a very active antiseptic agent, it falls considerably behind the bichloride of mercury and trichloride of iodine in its penetrating power.

Trichlorophenol and Lysol,

the former of which was tested eleven times, the latter but four, gave results very similar to those obtained by carbolic acid.

Chloride of Zinc

in a supersaturated aqueous solution was tested by methods I and IV. By the latter it falls somewhat short of carbolic acid, by the former it quite equals it, if indeed it does not

slightly surpass it. Its exceeding escharotic action and the pain often attending its application to the nearly exposed pulp in my opinion more than counterbalance any slight advantage that it might otherwise have over carbolic acid.

The Essential Oils

proved to be among the least efficient of the substances examined. In none of the tests made did the oils of *peppermint*, *cloves*, and *wintergreen* show any action whatever. In a few the oil of *cinnamon* turned out a little better, but its action was very slight when compared to that of the trichloride of iodine, bichloride of mercury, etc. The trichloride of iodine (*a*, *a'*, etc.) had about the same effect in fifteen minutes that the oil of cinnamon (*c*, *c'*, etc.) had in forty minutes."

In sixteen tests with various essential oils by the first method, in which the teeth were allowed to remain one and one-quarter to one and three-quarters hours in the oil, I found, without exception, *living* bacteria in the dentine at the close of the experiment.

Pyoktanin, *benzoic acid*, *alcohol*, *thymol*, and *resorcin* need not be referred to separately; they all fell so far short of the standard of efficiency manifested by other antiseptics, that they could not come into consideration at all for sterilizing cavities before filling. The same is true also of the double salts mentioned under V and VI. I should add, however, that pyoktanin, resorcin, and the double salts were tested only by method IV.

I may say in reference to pyoktanin in this connection that I have tested its power in other directions, and always found it undeserving of the high praise which it has recently received in America.

In carrying out the experiments described, three hundred and fifty-four tests were made; of these fifty-nine related to carbolic acid, sixty-three to sublimate, twenty-seven to peroxide of hydrogen, thirty-eight to chloride of zinc, eleven to trichlorphenol, fifty-four to oil of cinnamon, five to oil of cloves, ten to oil of peppermint, four to oil of wintergreen, three to benzoic acid, three to thymol, one to alcohol, four to lysol, forty-one to trichloride of iodine, seven to pentachloride of phosphorus, twelve to pyoktanin, eight to the double salt of gold and iodine, two to the double salt of potassium and platinum, and two to resorcin.

It may no doubt seem to most readers that *three hundred and fifty-four* experiments ought to definitely settle the question at issue, but to those who have been engaged in work of this nature for some time it will not appear so very strange that this should not be the case, but that more experiments should be necessary before the subject can be dismissed. It is therefore possible that the conclusions arrived at as the result of the above work may be modified by further experiments in the same direction. I am inclined to think, however, that the general results may be relied upon.

These are : 1. The complete sterilization of cavities of decay, especially such as contain traces, or even considerable quantities, of carious dentine, requires much more time than we are accustomed to give to it. When we have to sterilize a layer of some thickness, it is advisable, or we may say necessary, to apply the antiseptic on a pledget of cotton, and seal it in the cavity with the oxysulphate of zinc from one-half to one hour (or protect it in any way from the access of saliva) while some other operation is being performed.

In bad cases of acute caries, for example on the buccal surface of upper third molars, I not infrequently apply the antiseptic and leave it over night, in which case it must of course be protected by the oxysulphate, which is the only substance we possess which is at all adapted for inclosing applications on cotton.

2. The best results are obtained, as we should naturally expect, where rapidity of action is desired, by substances which are readily soluble in water ; it is for this reason, I take it, that the essential oils manifested so little action, their insolubility in the juices of the dentine preventing their rapid permeation of it.

In regard to the special results of these experiments I am, as intimated above, not quite prepared to express a decisive opinion, and reserve the right to modify my present views in any subsequent communication. At present I should head the list with the *trichloride of iodine*, were it not for its acid reaction, in regard to which further investigations are necessary.

There can also be no doubt about the powerful action of a five per cent. solution of the *bichloride of mercury*. The only question here to be taken into consideration is whether it might not lead to a slight discolouration of the tooth. This

I doubt, though it might be advisable to restrict its use at first to the molars.

I do not consider that there is any danger attending the application of a pledget of cotton saturated with a five per cent. solution to a cavity of decay, as such a pledget would contain but a fraction of the usual internal dose of the bichloride, and might even be swallowed with impunity. I myself have used still stronger solutions in connection with the teeth.

As for the *peroxide of hydrogen*, which is one of the most agreeable of all our antiseptics, I am inclined to think that where *but very minute traces* of carious dentine are to be sterilized a ten per cent. solution of it will act efficiently.

Where the antiseptic may be left for some time, particularly over night, concentrated carbolic acid will be sufficient to effect the sterilization, provided the cavity has been at least partially excavated before application. The pledget must, however, be well saturated with the solution, otherwise the quantity will be too small to permeate more than a thin layer of dentine. It has the advantage of obtunding the dentine at the same time, while an injurious action upon the pulp is not to be feared, except it be almost or quite exposed. I shall return to this subject in a subsequent article.

Cosmos.

CONTOUR FILLINGS: THEIR PLACE IN DENTAL HISTORY.

THE extraordinary efforts recently made in several directions to manipulate history, and have it appear that the dental profession has been indebted to two men for this form of filling, seems to require a more extended notice than has been accorded it.

The controversy has in some quarters assumed an unwarranted acrimonious character, and this personal feeling has in a measure obscured the facts. The development of the operation of stopping teeth, as all readers are aware, has not been the work of any one man. It has been a gradual evolution from the simple crowding of gold into a given

cavity to the adoption of perfected mechanical adjustments for the accomplishment of the same end.

The earlier period, which may be termed, to use Dr. George S. Allan's expressive phrase, the "face filling" epoch, continued up to about 1847. As far as the writer is aware, from reference and personal observation, very few attempts were made prior to this to extend the proximal fillings beyond the walls of the cavities.

About this period the active minds of Westcott, Townsend, Arthur, Dwinelle, Rich, and others were busy with efforts to produce a filling that should assume more nearly the original form of the tooth. The effort to build gold, piece by piece, lamina by lamina, was then in process of development; but the prevailing idea that all gold must be absolutely "soft" was a bar to progress in that direction.

The controversy that held the interest of the profession for a long time as to who deserved the credit for the introduction of cohesive gold was eventually very properly decided in favour of Dr. Arthur; but, in addition, it was also demonstrated that others had been making use of this form of foil some years anterior to its introduction by him.

It was well known to students of Dr. Elisha Townsend that he had a plan of "warming his gold" before filling but the value of this was not then appreciated by those who admired his work. It is in the memory of the writer that Dr. Townsend frequently exhibited gold built up on coin as an evidence of what could be accomplished in restoring form.

That Dr. Westcott made use of the cohesive form of gold long anterior to its general adoption is quite certain: but whether he understood its real value in connection with stoppings may be questioned. The writer never had the pleasure of examining any of his work, but during a residence in Western New York, in 1847, he became familiar with the operations of Dr. Westcott's pupils. While at that time incapable of criticising, the fact remained that teeth were contoured with gold built out to the original form in a way not possible for ordinary methods at that period. Years subsequently, many of these very perfect fillings came again under observation, and they fully confirmed the earlier judgment. These fillings were inserted by the *aid of the mallet*.

That contour filling had its rise about this period there can be no question. It was a natural development growing out

of changed conditions both in the material used and in the feeling that something better should be secured. This view is maintained by Dr. Jack ("System of Dentistry," vol. ii.), wherein he says, "The date when and by whom attention was first called to the prophylactic value of the truly contoured filling has not been clearly determined; the mode of practice appears to have been a gradual development which had grown out of the failure of the interstitial self-cleansing theories." It is impossible, however, to agree with the next paragraph, where he gives Dr. Varney the "credit not only for the most artistically produced expression in gold of the natural forms of the teeth, but of having a clear conception of their prophylactic value."

The formal introduction of cohesive gold in 1855 by Arthur led at once to the forming of gold surfaces more in accordance with the original shape. Contour fillings were common, indeed may be said to have been adopted among the better class of operators as early as 1858. Lost parts were replaced by gold built up to original and natural lines; incisors broken were reformed; entire teeth were built out with gold; molars were brought to the original masticating surfaces; in fact, all the work of the present was done thirty years ago as skilfully as it is performed to-day.

The place in dental history, then, of the work of Varney and Webb, so often quoted, is not as originators of contour filling or even of new processes, but as holding exalted positions as mechanics, worthy always of our remembrance and regard.

The time has arrived when dentistry should take a broader view than to suppose that the man who has succeeded in placing one piece of gold upon another is the ideal dentist. Dentistry means more than this. It means a liberal culture, a quite thorough knowledge of pathological conditions. It means the philosophy of treatment, and, consequently, it means, further, a capacity for diagnosis and prognosis. It comprises more of therapeutics to-day than at any former period, and he who is unfamiliar with all collateral subjects that enter into the training of an educated dentist, with a clear conception of the possibilities before him, has no right to regard himself a worthy follower of an honourable profession.

MODELLING COMPOUND *vs.* PLASTER OF PARIS.

By "PHINEAS," Ont.

So much is said and written at the present time about crown and bridge work, porcelain fillings, the construction of difficult regulating appliances, the treatment of pyorrhea alveolaris, the action of ferments, and the principles which underlie ordinary and extraordinary dental operations, that the writer almost feels as though he ought to apologize to the readers of this JOURNAL for introducing so common-place a subject as the taking of impressions. If the hundreds of young men who have just graduated from the dental colleges of the United States and Canada, were to be asked what material is the best for making impressions, probably nineteen out of twenty would answer, plaster of Paris. That is what our college professors say, and that is what we learn from our text-books. By the average American graduate, a hint that such is not the case would be taken as an evidence of ignorance or incompetence; and yet it is safe to say, that after those young men have been in practice for a few years, many of them will use modelling compound for a large proportion of the cases where they now use plaster. Why it should be considered heresy to point out the advantages of the former, and urge its use, is a mystery, and yet such appears to be the case. A professor of prosthetic dentistry, whose name is known to dentists all over America, made the statement not long ago, that he dared not tell his students to what extent he uses the compound for taking impressions, and how seldom he uses plaster of Paris. The writer, however, although taught differently, has no hesitancy in stating his convictions that, taking all things into consideration, modelling compound is the better material, and that he rarely uses anything else in his practice, even for crown and bridge work.

In the first place, it is admitted by all that with the compound thoroughly softened, and at the same temperature, an accurate impression with fine tracings can be obtained. The pressure necessary is not great, but is objected to by many because the soft parts yield readily, and are, therefore, compressed more than the roof of the mouth. This, instead of being an objection, is in reality an advantage. Under pressure the soft parts are forced into the position they are likely to occupy under a plate, and the necessity for relieving the

pressure of a plate on the roof of the mouth, so frequently referred to by dental writers, is removed. Then, too, its consistency is such that the loose tissues attached to the gum are pushed away, instead of imbedding themselves in the material and distorting the impression, as is often the case when a lower impression is taken in plaster. It is true an absolutely correct impression of a dovetailed space cannot be obtained by its use ; and, judging from the emphasis which dental writers attach to this fact, one would suppose that the fitting of a plate to the bottom of a dovetailed space was a very important matter. To take an impression of a dovetailed space in plaster is no easy matter either, but supposing it is accomplished, what has been gained ? The plate may be fitted to the floor of the space on the model, but it can never be inserted until it has been trimmed to the size of the opening, and then no longer fills the space at the bottom. If compound is used however, if removed at the proper time it will yield slightly by virtue of its elasticity, and the model, when made, will present a space to which a plate can be fitted, which in most cases will go into place in the mouth without trimming.

The absence of the air bubbles in the impression, the exactness with which the amount of material can be gauged, the ease with which the model can be separated from the impression, and the freedom from injury of the former in the process, might all be referred to, but are of little consequence compared with the comfort of the patient during the operation. While there is nothing disagreeable in the sight, taste, or smell of the compound, the use of plaster frequently produces nausea and loathing. The very sight of the white semi-fluid mass before it is put into the mouth is enough to turn a delicate patient sick, and when to this is added the insipid taste and the sensation of a creamy mixture gradually hardening in the mouth, with now and then an odd piece breaking off and dropping into the fauces, is it any wonder that many look upon taking the impressions as worse than the extraction, and wear a temporary denture months longer than they ought sooner than submit to its repetition ? The dentist who attends most closely to the wants and comforts of his patients will always be most successful, and the change from the use of disagreeable choking plaster of Paris, to the comparatively pleasant and cleanly modelling compound, is certain to add not a little to a dentist's professional popularity.

Dominion Dental Journal.

SALIVARY CALCULUS—ORIGIN AND CAUSE OF ACCUMULATION UPON THE TEETH.

BY W. WILLIAMS, M. D.

The origin of salivary calculus is undoubtedly the saliva. Saliva is the secretion of two types of glands, the serous or albuminoid and the mucous. The former are situated outside the mouth and include the parotid, submaxillary and sublingual.

The mucous group includes the glands and follicles that are situated or imbedded in the walls of the mouth and are the labial buccal, platine and lingual.

The salivary glands are most active immediately before and during a meal. The mucous glands contribute most of the saliva between the meals.

The reaction of the salivary secretion is alkaline, that of buccal glands slightly acid, and that of mixed saliva slightly alkaline or neutral.

The saliva is composed of about five per cent. of solids, the balance water. The solid portion is made up of the ferment ptyalin, the salts of lime, potassium, sodium and magnesium, with the debris of epithelial scales and food. It is also rich in micro-organisms.

Saliva is a secretion and not an excretion, the latter is of no further use in the economy while the former is. The urine furnishes an example of excretion while saliva is an example of secretion, being of further use as an aid to the digestion of food. The substances found in an excretion are found as such in the blood and it is possible for an excretory organ to be removed and another organ to take on and perform its unfulfilled function. The secretions and excretions of the body are saturated with the different salts they hold in solution.

These solutions are subject to the same laws, both physical and chemical, that govern solutions outside the body. A saturated solution of common salt or nitrate of potash, for instance, will remain clear until a foreign body is introduced, when crystalization will commence around this nucleus immediately and continue until the whole volume is crystalized.

The saliva is particularly saturated with the salts of lime which have a special tendency to throw down a precipitate.

The salts of lime differ from most of the other salts in being

more soluble in cold than in hot water. The formation of calculi is rather common in all the secretions and excretions, particularly in the gall-bladder, where they are known as biliary calculi. In the kidneys and bladder they also occur and occasionally a calculus is found in the salivary glands or their ducts. Biliary calculi is found most generally in females and men of sedentary habits, perhaps accounted for from the precipitation of some of the elements of the bile in the gall-bladder from mere sluggishness. It is thus seen that the most guarded and best protected secretions are liable to have this calculous formation. Is it then any wonder that a deposition of calculus upon the teeth is common when we remember the composition of the saliva and the changes it is exposed to in the mouth. Every experiment is here played with it, freezing and boiling liquids, acids, alcohol, and a long test of other substances too numerous to even mention them, are daily mixed with it.

Diseases, constitutional and local, want of use, physical and chemical causes, any one of these might vitiate, disturb and change the nature of normal saliva and cause a precipitation. We must not forget the micro-organisms that play such an important part in the saliva, which soon, when at rest, is rendered acid by the fermentation products due to their activity the chief source of acid present in the mouth being due to these organisms. This fermentation takes place rapidly wherever the conformation of the teeth allows the process to be undisturbed.

Thus we see that there are various conditions always present that might cause a precipitation in the saliva. The teeth form such splendid nuclei for this precipitation, when once formed, to be deposited upon, where unfortunately it is often allowed to remain undisturbed.

The composition of salivary calculus is roughly :

Lime Salts.....	80 parts.
Mucous.....	12 "
Ptyalin.....	1 "
Organic Matter.....	7 "

THE FIRST MOLAR.

By DR. E. H. ALLEN, Freeport.

IN writing upon this subject my desire is to correct some of the wrong ideas entertained by some members of the profession in regard to the first molar.

I shall not aim to instruct you in the development of these teeth, as they are developed as others of the permanent set. I shall consider principally "What shall be done with the first molar as we usually find it in its normal position in the mouth."

Coming as it does, at a tender age, when the conditions of the mouth are most unfavourable, we generally expect to see this tooth more or less affected with caries. Too often, I am afraid, the disposition is to extract, and against this I wish to enter a vigorous protest.

The first molars are the largest teeth in the mouth. They are as perfectly formed as any of the permanent teeth. I am many times led to think they are better formed and developed than the second molars, for I have often noticed that the latter require filling first.

Let me now suppose that a child about seven years of age is brought for examination and advice in regard to the teeth. A glance into the mouth reveals the fact that one or more of the first molars are beginning to decay. I urge upon the parent the importance of immediately filling all points where caries has begun. If the parents have the idea that these are first teeth (and many of them have the notion that they will be replaced by others), I try to show them they are in error, that the tooth is one of the permanent set.

Often the second deciduous molar is effected with extensive decay on the distal surface. In that case I should freely cut it away, so that the liability to decay from that source would be materially lessened.

I would never extract this tooth if there were any possible way of saving it. I never would extract with the view of making room for the other teeth, *i.e.*, to prevent possible irregularity. In this opinion I am supported by many members of the profession whose knowledge, skill and sound judgment are not to be questioned.

But, however, in many instances, caries has made such havoc with these teeth that large portions of the crowns have

been lost, and pulps nearly, if not altogether, exposed ; and two often the patient has had genuine toothache before thinking of giving the dentist a call. Now what shall be done ? In a letter recently received from Prof. Darby, of Philadelphia, in regard to this subject he expresses the opinion that prior to the tenth year the proper course in treating a first molar in the condition I have described, would be to cap the pulp, and if that were not successful, extract rather than remove the pulp and fill the roots ; and furthermore, he is of opinion that the first molar should not be extracted later than the eleventh year.

Prof. Darby's opinion seems to me a very sound one, though he gives no reason why he should not devitalize the pulp before the tenth year. I have done so in a great many cases and as yet have not seen any bad results, though successful capping and retaining a live pulp in the tooth is much to be preferred in any case ; and if at any time of life the pulp can be successfully capped, it surely is prior to the tenth year.

One objection to devitalizing the pulp prior to the tenth year is this : The tooth at that age is not nearly so hard as it will be some years later, and if the pulp is removed, all nourishment of the crown ceases. If it be extracted before the second molar is erupted, that tooth can take its place. That may be the reason why Prof. Darby would not devitalize but rather extract when he could not save the pulp alive.

Extraction of the first molar at any time after the second has taken its place is certainly not correct practice. It has been the practice of many dentists to extract the first molar to relieve a crowded condition and correct irregularities of the teeth. This I hold to be wrong. Where it is done after the second molar has taken its position the result will be more or less interference with the correct articulation of the teeth ; usually by the second molar tipping forward so that the distal surface of the tooth becomes in part articulating with the opposing teeth. I have seen cases where the second inferior molar has become almost useless, and yet the anterior teeth were no less crowded than before the first molar was extracted. We all no doubt see cases almost daily where permanent injury has been inflicted on a patient by the extraction of this valuable tooth. On the other hand, who has not observed how much better the conditions have been where the first

molar had been saved—the arch more perfect in outline, the teeth of either jaw standing up to their work.

In the February number of the *Cosmos*, 1888, page 70, there is published an article written by Dr. E. Andrieu, of Paris, read by Dr. Shepard, of Boston, before the Dental Section of the International Congress. The essayist does not think the first molar properly classed among the permanent teeth. That time past, he assumes that its usefulness is gone, and that it should usually be extracted. He also states that the wisdom tooth is hindered in its eruption, usually, by the presence of the first molar, and caused to decay, giving an additional reason for the extraction advised. I am glad the discussion following this paper showed that the American members of our profession were on the right side, advocating the value and importance of the tooth.

I believe we should be careful to call the attention of parents to the first molars, speaking early, long before the child is six years old, so will think about the matter beforehand and be prepared to attend to the needs of the first permanent teeth. It is a matter of education; the dentist is the teacher and the parent the pupil. If we can make our patients intelligent as to the teeth, we will not have those molars coming to us hopelessly decayed.

When to extract, or not, is a question depending on many conditions, and also the circumstances of the patient; but this I believe, that fully one-half that are extracted the patient would be glad to have saved if they were made to know it could be done; and if we do our duty as dentists we will give the patient knowledge of the facts, and the chance of having the tooth saved, where possible.

I have tried in this paper to express clearly my ideas about this important tooth, but fear I have not succeeded. One thing, however, I have learned in studying the subject, that there is vastly more in it than I had ever thought of before, and there is much more, no doubt, that you will think of and bring out in the discussion.

Trans. Illinois State Dent. Soc.

STANDING AT THE LEFT SIDE.—It is surprising to note the few, even among experienced operators, who stand (or sit) at the left side of the patient when scaling the teeth of that side or operating in many of the cases which can be so much better and more comfortably reached from that side.—*Cosmos*.

Reports of Societies.

STUDENTS' SOCIETY NATIONAL DENTAL HOSPITAL.

THE last ordinary meeting of this Society was held on Friday, May 8th, at 8 o'clock. R. DENISON PEDLEY, Esq., President, in the chair.

The minutes of the previous meeting were read by the Secretary, and confirmed.

Messrs. Beverley, Watson, Clarence Read, Stanley Read, and Miss Brierly were present as visitors, and were received by the President in the usual manner.

Messrs. Beverley and Myers were nominated for election at the next meeting.

CASUAL COMMUNICATIONS.

Mr. FARO presented a model of the case he brought before the Society at the February meeting, shewing the extent to which the antral mischief had abated.

Mr. STANLEY READ shewed three cases:—

1. A temporary canine with a large absorption cavity in the side of the root.

2. A case of gemination of a right lower central and lateral, the union being so perfect that it looked like an upper central with a groove down the root.

3. A splint that he applied to a case in which the upper right canine was driven into the jaw, the top level with the gum, and the first bicuspid broken in. He gave gas, and extracted both teeth, replacing the canine, the bicuspid being worthless, and ligaturing it to the splint which was worn by the patient for six weeks, at the end of which time it was quite firm, in good position, and useful for mastication.

The PRESIDENT brought forward an upper central incisor shewing absorption of two-thirds of the fang; and also the elevator he considered superior to any other.

The former led to a long discussion on absorption, in which the President, Messrs. Greetham, Humby and Clarke, took

part, at the conclusion of which Mr. Stanley Read was called upon for his paper on "Fractured Jaw, and its Mechanical Treatment from a Dental Point of View."

The paper was followed by a short discussion between the President, Messrs. Humby, Clarke, Danlop, and Clarence Read.

Mr. Stanley Read having replied, the meeting was adjourned till Friday, June 5th, when a short paper will be read from Mr. Thos. Gaddes, on "Some Observations on the Physiology and Seat of Pain."

Dental Hospital Reports.

MONTHLY STATEMENT of operations during April, 1891.

	London.	Manchester.
Patients . . . . .	.	1243
Extractions	1661	811
„ under Anaesthetics	1494	230
Gold Fillings	364	112
Other Fillings	1042	283
Irregularities	56	—
Miscellaneous	555	278
Artificial Crowns	12	—
Total	—	1714
	—	—
<i>House</i>	W. MAY,	
<i>Surgeons</i>	W. S. HOLFORD,	A.H.DERWENT
	G. HERN.	

ANSWER TO CORRESPONDENT.

C. C.—It is very annoying, but we doubt whether it would be worth your while to take further proceedings other than to send in an account for the balance of fee with an explanatory letter. It is wiser, in such cases, to take a full fee for the earlier work, explaining that it will be deducted from the final account. We cannot give you a legal opinion, but is it not possible that the acceptance of the modified fee would rather spoil your claim at law for any further demand?

British Journal of Dental Science.

No. 562. LONDON, JUNE 15, 1891. VOL. XXXIV.

EXOSTOSIS.*

By DOUGLAS E. CAUSH, L.D.S.I.

MR. PRESIDENT AND GENTLEMEN,—Before reading the paper I have the honour of bringing before you to-night, I desire to thank Mr. T. Charters White, for had he not drawn attention in the *Journal of the British Dental Association* to the method of preparing hard sections by means of ground glass and pumice powder, this paper would probably never have been written. Having tried the method as suggested by Mr. T. C. White, we were surprised at the ease with which hard sections could be prepared. After having prepared a few of these and not understanding the variations of structure seen under the microscope, we were led to consider the desirability of studying the subject of exostosis more fully than we had previously done.

The plan adopted was to take a tooth and cut off as many sections as it was possible to obtain, commencing at the apex of the root, and leaving off at that point of the tooth where the enamel joins the cemental tissue ; thus a series of sections were cut from each tooth. These were numbered as cut off and mounted in their consecutive order, thus enabling us to examine any portion of the root, and to trace any modification of the tissue seen under the microscope. We shall this evening, by the aid of some of the slides so prepared, bring before you the result of our examination.

One of the first things noticed in the roots of teeth exostosed was the absence of the original layer of cemental tissue as seen in teeth of normal structure, and in many cases great alteration in the granular layer ; by the granular layer we refer to that layer of somewhat porous tissue existing between

* A paper read before the Odontological Society.

the dentine and cementum at the point of union of the two tissues.

The original cemental layer was in almost all cases absent at or near the apex of the roots, and instead of the well-marked line of demarcation between the two tissues, the dentine terminated in an irregular manner, the edge of the dentine being entirely broken up, while in place of the granular layer there is a mixture of the two tissues, oftentimes showing in the dry sections large irregular spaces, these spaces probably having been filled with semi-fluid matter before the teeth were extracted.

Nearer the crown this absorption was much less marked, though here and there the dentine was scooped out at different points of the tooth and afterwards filled with cemental tissue, yet the nearer the crown the more perfect the granular layer; but at those points where absorption had taken place the line of demarcation was much more definite than at the apex.

These changes are probably due to the fact that in all cases where new tissue is being formed, one of the earliest stages is a slight increase of the blood supply, so slight, perhaps, that it does not produce any feeling of discomfort to the patient, while on the other hand it does produce increased activity in the cells forming the alveolo-dental membrane, and at the point where there is an increased blood supply the cells become active, and there are probably a large number of cells developed, similar in character to those cells known as giant cells or osteoclasts, their duty being that of absorption. This increased blood supply produces one of two results, the cells either commence to absorb the alveolus, or the cemental layer surrounding the dentine. I think when the irritation is slight, its first action is upon the cemental tissue, and these cells are developed in the alveolo dental membrane on that surface which is attached to the layer of cemental tissue; these cells at once commence to absorb the tissue, and after having absorbed the original layer of cementum pass on to the granular layer. This layer being but imperfectly calcified is easily absorbed away, and the absorption goes on till the cells come in contact with the dense and more calcified tissue of the dentine; here, as a rule, the absorption ceases, but if, as is sometimes the case, the dentine at this point is imperfectly calcified, the absorption goes on till the dense portion of the tissue is reached, thus producing the irregular margin as seen in some of the sections after the granular

layer and soft portions of the dentine have been absorbed away, and, as the cells come to the more perfectly calcified tissue, this process of absorption receives a check and is discontinued, plenty of room having been obtained. A change now takes place in the cells, they no longer press upon the tissue, and thus they cease their functions, while many of them become changed in character to true cementoblasts or cementum producing cells; these soon calcify after others are developed, and a layer of new tissue is formed close to the dentine, partially filling up the irregular spaces previously produced by the absorption, while here and there, entangled amongst this new tissue, are to be found a number of cells corresponding to the giant cells already referred to; these cells are coloured by the carmine stain, and a great many of them occur in some of the slides we have examined. Leaving now for a short time the apex, and on examining the sections nearer the crown, we find here and there scattered over the section, certain portions of the dentine absorbed away in semi-lunar cavities, and these cavities filled with cemental tissue. These markings have already been brought before this Society by Mr. G. Henry, of Hastings, in a communication entitled "Enostosis."

The absorption is, as a rule, restricted in area, but usually of much greater depth than the absorption as seen at the apex. We shall endeavour now to throw on the screen slides showing this form of absorption. In many of these sections it appears as if the absorption does not take place until after one or more layers of cemental tissue has been added to the root of the tooth, thus differing from the early stage of absorption already spoken of. Dr. G. V. Black well illustrates this in his work "On the Periosteum and the Peridental Membrane."

We will now ask you to go back so that we may consider the development of the cemental tissue. After the cementoblasts have been active for some time, and a layer of cemental tissue has been calcified around or partially around the root, there appears in many cases to be a time of rest, and this time of rest produces certain markings that appear somewhat like lines surrounding the dentine. These lines are known as "incremental lines of Salter;" they do not mark out equal layers of tissue around the dentine, but are frequently very irregular. We may often find on the one side a large deposition of tissue, while, on following the incremental lines, we

find they contract until they are but a very slight distance from the previously formed line. These lines also enable us to draw conclusions as to how the tissue has been deposited whether it has been rapidly deposited, or otherwise ; for in the rapidly-deposited tissue there are usually very few lines, but a large number of lacunæ. These lacunæ are as a rule large, and with plenty of canaliculi radiating from them, while in the slowly-deposited layer the lacunæ are much smaller and with fewer canaliculi ; the lacunæ are also as a rule further apart, and the tissue is at many points an almost structureless matrix. This condition appears to be produced by continuous irritation, though the irritation may be so slight that the patient is entirely unconscious of anything being wrong with the tooth, and I believe it may be produced by slight alteration of the articulation, or any other slightly disturbing factor that will keep up continuous, but slight irritation of the membrane surrounding the cemental tissue. In those cases where the incremental lines are manifest there have been times of rest, and each layer appears to be distinct from its predecessor ; this I think can easily be understood when we consider the growth of the cemental tissue—it is from within outwards, that is to say, from the surface or edge of the dentine towards the alveolus. May not this also help us to form correct ideas as to the way in which the tissue has been re-absorbed, for in many cases, after one, two, or more layers of cemental tissue has been deposited, there are definite lines of reabsorption, this probably taking place after a time of rest and on the renewal of activity. This re-absorption, is also well shown by Dr. Black in his work already referred to, at a later period a fresh layer of tissue is re-deposited to fill up the cavities produced by the absorption. This absorption may be produced from a larger blood supply inducing increased activity in the cells, on the inner surface of the membrane, produced by periostitis or even the more acute alveolar abscess. Some of these markings are certainly produced by the latter, for we frequently find that, a large portion of the deposited tissue has been re-absorbed in those cases where there has been either acute or chronic abscess. We also find in some of these cases, especially where the abscess has been chronic, not only that the cementum has been absorbed, but that even the dentine has been absorbed, leaving pits or depressions that sometimes pass almost into the pulp chamber ; and even these are found in some cases to be lined or filled with a fresh layer or layers

of cemental tissue : this occurs in cases where the tissue has become healthy after the abscess had enlarged the cavities. The excavations of a semi-lunar character as seen nearer the crown in the granular layer, are probably produced at those points where the dentine is defective in structure, and had we been able to examine the tooth prior to the absorption of the tissue, we should probably have found interglobular spaces and imperfectly calcified tissue.

We also noticed that in the additional tissue there is oftentimes a number of canals, many of them having a lining membrane, and it appears as if the new tissue had been deposited around the blood-vessels in the alveolo-dental membrane, and by the presence of a membrane in these canals we may presume that they were used for their original purpose after the new tissue had calcified. It would appear as if it was easier for the newly deposited tissue to pass around a blood-vessel than to absorb the tissue composing the walls of these vessels, thus we find in the cemental tissue, canals both transverse and longitudinal ; these canals probably supply nourishment to the tissues, and in some cases, I believe, to the pulp itself. This now brings us to the next point of consideration, the connection between the pulp and the cemental tissue. In many cases we found there was an intimate connection between the two through the dentine, by means of canals, these in many cases passing at right angles through the dentine. Some of these canals where passing through the dentine, are found to be lined with a tissue corresponding in microscopic structure to that found in the cemental layer, and it would appear as if the canals had in some cases been larger than they were at the time of the extraction of the tooth, and had been reduced in size by the deposition of a tissue having lacunæ and canaliculi as in the cementum.

Another point of interest is the external contour produced by the additional tissue. This tissue oftentimes unites two or more roots together, and forms one solid mass of tissue. Though much new tissue may have been deposited it is very exceptional indeed to find ankylosis of the roots to the roots of adjoining teeth, or even to the walls of the alveolus, and I think this may be accounted for by the fact that as the cemental tissue is deposited on the cementum, we frequently find the alveolo-dental membrane contains a number of giant cells near the external surface, and doubtlessly these cells absorb the alveoli. At the same time the new tissue is being

deposited upon the surface of the cementum, the work of these cells being the same as in the case of the permanent tooth, where the cells in the membrane absorb the roots of the temporary teeth, and thus there is always a layer of membrane between the two tissues, that of the cementum and that of the alveolus. In those cases where a piece of alveolus has come away during extraction, I have only found the two connected by fibrous tissue, and there has been no true bony tissue uniting them. We also found in some cases the cemental tissue was deposited in irregular patches and nodules over the surface of the roots, and in such cases it is usual to find the original cemental tissue has been absorbed away at these points, and the dentine has been scooped out, leaving a series of semi-lunar cavities; these cavities are afterwards filled with new tissue, and I think this is the way in which the change spoken of as "Enostosis" has been produced. At the margin of this new tissue we frequently find the tubuli of the dentine anastomosing with the canaliculi of the lacunæ of the new tissue, and thus forming a direct means of communication, either of sensation or of, in some cases, plasma for nourishment to the tissues to or from the pulp. This also is the cause, I believe, of the hyper-sensitiveness of that portion of the dentine directly under the enamel. The inter-globular spaces are filled with a semi-calcified substance, and these spaces are brought into communication with the pulp through the tubuli. That these tubuli are minute canals filled either with a fluid, or semi-fluid may be demonstrated as follows:—Take a newly extracted tooth with a live pulp, and if it can be obtained from a young patient so much the better, as the tissues are less thoroughly calcified; then with a corundum wheel grind until the pulp is almost exposed, afterwards break through the thin wall of bone to expose the pulp, place this in alcohol for a few days, or if necessary weeks, then place it into an alcoholic solution of any of the aniline dyes and allow it to remain in this solution for a few days; then take the tooth out and wash thoroughly in water, and after it is thoroughly washed rub down between two pieces of ground glass with pumice powder and water, finishing with water alone: after it is rubbed down mount in balsam with the surface water removed as suggested by Mr. White, now examine with $\frac{1}{8}$ inch power, and I think there will be no doubt as to the condition of the tubuli. Such a section I have with me and shall be pleased to place it under the microscope

As we may imagine, where we have a large amount of new tissue deposited, it is not at all an unusual thing to find encysted lacunæ in this tissue, as if for some cause the single, or perhaps a group of two or more cells, with their walls absorbed away have become calcified and are quite distinct from the surrounding tissue, and this brings us to the last change we wish to bring before you to-night, and that is, the alteration of the shape and condition of the pulp chamber and canals. In exostosed teeth we have noticed, especially in those teeth that have been much exostosed, that there is a great alteration in the character of the chamber or canals, and in the dentine surrounding the same. Rarely do we find that there is any pulp-calcification, as seen in those teeth where secondary dentine is produced, or as seen in cases where pulp stones are produced by the partial calcification of the pulp; but in cases where there is any amount of exostosis it would appear as if absorption of the dentine surrounding the pulp had gone on at the same time the changes were taking place on the exterior surface of the root, so that the canals became enlarged, and that in a most irregular manner. We frequently find the canals of two or more roots thus form one continuous canal, and in many of these irregular (oftentimes semi-lunar) excavations giant cells (osteoclasts) are seen similar in character to those seen between the dentine and the cementum, and in the alveolo-dental membrane. It would appear as if these cells were the motive power for producing these excavations.

There also appears to be a second stage in the changes that take place, and this also agrees with those changes that take place on the exterior of the root, namely a redeposition of tissue after the absorption has taken place to, partially—or in some cases fully—occupy the space left by the excavations previously made.

This tissue corresponds in character to the tissue being deposited upon the exterior surface, and is in many cases the same in microscopic structure, with lacunæ and canaliculi anastomosing with those surrounding them in the newly-deposited tissue. May not this show us why we have such difficulty in diagnosing between exostosis and disease of the pulp, though as far as we have been able to ascertain, gradual and diffused exostosis does not produce any acute pain, but where acute pain has been induced, the new tissue has been deposited at the apex of the root or roots, and constricts the

pulp itself at the point where the pulp leaves the apex of the tooth ; or exostosis may produce pain in those cases where we have slight irregular patches (nodular) of new tissue deposited over the root. At these points there has been absorption of the original cemental layer, and penetration into the imperfectly calcified dentine in the granular layer, thus setting up irritation through the impulse passing through the tubuli of the dentine direct to the pulp itself.

NOTE ON AN EXAMPLE OF REFLEX ACTION.

By WILLIAM R. TUCK, L.D.S., Eng.

FOR some time past, my mind has been much exercised in the study of those almost endless forms of disease which are often forcing themselves upon our notice, in this civilized nineteenth century. Many of these affections are of such a novel and complicated character as to make diagnosis difficult to the general practitioner. I once read with much satisfaction two papers written by Dr. Edis, of Middlesex Hospital, whose views on this subject seemed quite in unison with my own. I was hoping to see a continuation of such articles from his pen, but for some unknown cause they ceased, eager, as I was, that such a topic should not be longer hidden from the professional reader.

Without further preface I will now narrate a case of reflex action which has recently come under my notice. A lady about thirty years of age had been bedridden for three years from what was pronounced to be a spinal affection, for the whole of that time she had been under medical treatment, blistered, leached, and medicated, *ad nauseum*, with no abatement whatever of her distressing symptoms. The case was first mentioned to me by a friend who knew I had given considerable attention to diseases arising from reflex neurosis, and which in the majority of cases I had traced to diseased teeth.

On my first visit to the lady in question, I was informed that her usual health was fairly good. On examination of her mouth I found two lower molars, one on either side, in a state of necrosis, they had been stopped with amalgam. I suggested the advisability of removing them, and that without delay, to which she demurred on the ground that they

gave no pain; that however, proved conclusively that the suffering in the spine arose from these dead teeth, and was of a reflex character, I explained to her that was the origin of this affection. After I had strongly impressed this upon my patient, she submitted to having them extracted. In the course of a few weeks I had the satisfaction of hearing that she was much better, and making rapid advances towards recovery. I found it necessary to explain that the cure *might* be prolonged, though the cause had been removed, owing to the protracted suffering, at first reflex, becoming absolute. In order to expedite the recovery, I advised the use of small doses containing iodide potassium, with aconite, which seemed to aid in bringing about the happy result mentioned.

NITRATE OF AMYL IN CHLOROFORM POISONING.

DR. E. MAMMEN, of Bloomington, Illinois, reports (*New York Medical Record*, April 25th, 1891), a case of chloroform poison successfully treated with nitrite of amyl. He was called to a man who had taken chloroform, and could not be aroused. On reaching the patient's bedside, about half an hour later, Dr. Mammen found him in a profound stupor, the respirations being shallow, and the pulse rapid and feeble. A 3oz. bottle was found in his coat pocket half full of Squibb's chloroform, and it was ascertained that he had purchased three ounces of the drug some two hours before. He had, therefore, apparently swallowed about an ounce and a half. Air was at once freely admitted to the room, and a "pearl" of nitrite of amyl given by inhalation. The effect was immediate. After the lapse of fifteen minutes, the pulse again becoming rapid and feeble, another "pearl" was administered, with the result of deepening the respirations and increasing the strength of the pulse. The same thing was repeated eight or nine times at lengthening intervals. In addition to this, two hypodermic injections of atropine were given, and towels wrung out of cold water were dashed upon the chest. After four hours the patient awoke from stupor, and in another hour was out of danger. Recovery was, however, somewhat slow, and extreme icteric discolouration of the skin persisted for two weeks. In Dr. Mammen's opinion, the man could not possibly have survived but for the administration of nitrite of amyl.

British Medical.

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OUR OLD MEN.

Of all the functions at which Society assists none are, perhaps, more interesting than complimentary banquets to distinguished men, and by this we mean not only to men who have occupied, or are occupying, high positions, but also men for whose living their fellow-men have cause to be thankful. Such a banquet was held on the last day of January of the present year in New York in honour of the "Dental Patriarchs," that is to say in honour of those Dentists, now living who were in practice about 1840. Men who, therefore, have laboured for over half a century, not only that by the sweat of their brow they might live, but also that by their work their profession and their fellow-men might be the better. To younger men there is no doubt something very attractive in these their seniors who have lived so long and so well, that they have earned a reputation such as it must be the ambition of all to attain. But in this feeling which, for lack of a better word, we may call envy, one is apt to forget the personal benefits which we now-a-days are receiving solely as the result of the work of these "Patriarchs." It is perhaps a somewhat melancholy thought that the exacting nature of our calling, renders a continuance in practice in later years especially trying. Dentistry is essentially the profession of middle life, when a man has had that practice, which gives deftness to the fingers, and that experience, which gives soundness to judgment, whilst at

the same time he has that strength which allows him to carry out his own precepts to the full. In this our profession stands in marked contrast to most others. It is perfectly true, that in ours, as in these, the experience gained as the years roll by is of infinite value, but unfortunately to but few men is it given to retain that endurance which renders a continuance in the ordinary routine duties of dental practice possible. In this, however, it must be apparent that there is a gain to the profession as a whole if it enables these "Patriarchs" to give their time and energies to the affairs which interest and are of importance to us as a community. It must therefore be and we believe is the wish of all to keep these, our seniors in touch with our various organizations, so that though the labour of routine work falls on younger shoulders, the old heads may be at hand with their advice. Of course we know there is such a thing as out-staying one's welcome, and nothing is perhaps more sad than to see a man clinging on to a post oblivious that the tide of progress has swept along and left him high and dry on the shore of antiquated ideas and practices. But these remarks are only applicable to teachers in our schools, and not to the many posts in our professional unions where the advice of these old men must ever be listened to with respect. And indeed even as regards the teaching in our schools, though it is most desirable that our students should be thoroughly in touch with the advances of the times, yet we cannot help feeling that one is apt to assume a greater progress in our Art than facts would support ; too great praise of ourselves at the expense of those who have gone before us ; and we fancy that a more careful reading of history, a more careful examination of later day ideas would lead to the conviction that much which is new is not true, and much that is true is not new. Still, whatever may be our notions as regards the relative value of "our old men" we are sure all will welcome such tokens of respect and recognition as this and similar banquets tender them. It is, alas ! too true that we shall be all old soon. A dentist's life is spent in performing a multitude of little things. Little enough is

the recognition he obtains for his work, and the greater therefore should be the inter-professional eagerness to recognize the services which those members render us who do ought to advance our social status or our professional knowledge. We are indebted to the Secretary for sending us a copy of the Report of the speeches at this dinner which have been printed to serve as a souvenir of the event.

It is very sad that this banquet should have been so soon followed by the death of one of the most eminent of the patriarchs, Dr. Wm. Atkinson. A man who seems to have earned wide respect by his kindly nature and earnestness of purpose, whilst the breezy nature of his speeches always gained for them the attention they deserved. We regret also to notice the death of Dr. J. W. White, chairman of the S. S. White Dental Manufacturing Company, and Editor of the *Dental Cosmos*.

The following Abstract of a paper by Mr. J. Howard Mummery on "Some points in the structure and development of Dentine," communicated by C. S. Tomes, F.R.S. to the Royal Society will no doubt be read with interest. We hope to give the paper in *extenso* in a future issue.

"The purpose of the present paper is to show that there are appearances in dentine which suggests that it is formed by a connective tissue calcification, and that the process is more closely analogous to the formation of bone than has usually been supposed.

"The varied theories held as to the structure and development of dentine are partly due to the difficulties met with in the investigation of this tissue, soft and hard parts having to be retained in their natural relations to each other. Decalcification of the dentine by acids has been resorted to, a mode of preparing microscopical objects for study which is open to many objections. Sections cut by a process recommended

by Dr. L. A. Weil, of Munich, exhibit the natural relations of pulp and tooth without the necessity of resorting to decalcification. Fresh specimens are fixed in sublimate, passed through gradually increasing strengths of spirit to absolute alcohol, and slowly impregnated with a solution of desiccated balsam in chloroform, dried with more balsam over a water-bath, and cut down on a stone with water. The present investigation was undertaken with the aid of this process, controlled by the examination of other specimens cut by the more ordinary methods.

“Processes or bundles of fibres are seen, incorporated on the one side with the dentine, and on the other with the connective tissue stroma of the pulp; some of the bundles give evidence of partial calcification, reminding one of similar appearances in the calcification of membrane bone. Cells are seen included in the bundles and lying parallel to their course; these cells it is concluded, form together with the odontoblasts the formative cells of the dentine, the calcification of which tissue should be looked upon as in part, at least, a secretion rather than a conversion process, the cells secreting a material which calcifies along the lines of and among the connective tissue fibres, the cells themselves not being converted into dentine matrix. These appearances are seen in the rapidly forming dentine of a growing tooth, as well as in more fully developed specimens. An examination of other Mammalian teeth reveals similar appearances. The dentine of the incisor of the Rat (*Mus decumanus*) shows with great distinctness the incorporation of the connective tissue fibres with the dentine, and there is a marked striation of the dentine near the pulp cavity, parallel with these fibres. The ivory of the Elephant's tusk shows the same relation of connective tissue to formed dentine. Vaso-dentine exhibits a very well defined connective tissue layer surrounding the pulp. This layer has hitherto been looked upon as consisting of odontoblasts, but this tissue shows no nuclei, and has the characters of a layer of flattened connective tissue fibres—a layer of nucleated cells in close opposition to the dentine probably being real odontoblasts of vaso-dentine.”

THE etiquette pertaining to the acknowledgment of the source of Abstracts seems rather a hazy point in the minds of some of our fellow editors. Our own view, and one we always endeavour to put in practice, is that this source should always be stated. Two instances of non-acknowledgement came under our notice in recent journals, the one is referred to under "German Abstracts," the other occurs in our excellent contemporary, *The Western Dental Journal*. The latter is a reprint of our leader of last December 1st issue, on Children's Teeth. By a curious mistake the leaderette on patents which follows, is printed as if it were part of the former. Readers will surely wonder whither they have wandered.

REPORT reaches us that the Odontological Society, and the British Dental Association are under notice to quit their present quarters in the Dental Hospital at Leicester Square. The need of increased accommodation has been sadly felt in this institution, and it is an open secret that any attempt to increase the present building, or to migrate elsewhere is surrounded by difficulties. We understand it has, therefore, been determined to utilise the space gained by the removal of the above mentioned Societies for hospital purposes. Rumour says that the gallery of the theatre, now occupied by the Odontological Society's museum, is to be widened and chairs are to be placed in it. The theatre to serve the joint purpose of waiting room and lecture room, whilst the present Council room and extracting room will change places, and the Odontological Library is to be utilized as a class-room. We give these reports as they may interest those who are intimate with the building as it now is, but of course without any guarantee as to their accuracy.

How other people see us is always interesting, and the notions of the laity regarding our Art can hardly be less so. We feel, therefore, that we need offer no apologies for print-

ing the following letter which a correspondent has been good enough to favour us with :—

“ Dear Sir,

The teeth that you repaired a few years since for Mr. ———, have broken again, has them fastened with wire. We want to know what day you will have your smithy hot so that it will make no delay. We also want to know what you would charge for remodelling a new bottom set of teeth that are new but not made for him, but nearly fit. An answer will oblige. Trusting you and Mrs.—— are quite well.

Accept our kindest regards.

Yours obediently,

M——.”

To Mr. ———

P.S. We thought you might have a fixed day in the week for heating smithy.”

COAL FILLINGS.—On page 243 of the DENTAL COSMOS for March there is an article on “Filling Teeth with Charcoal,” by Dr. Forberg. He has simply rediscovered something that both German and French dentists used over twenty years ago, as I have reason to know from patients of mine who had been to dentists in those countries, and had pulp-canals filled with carbon. I have used it frequently myself since that time, but would recommend it only as a temporary filling, or what might be called a dressing, as it is too porous for a permanent filling, and experience has taught me that it will get foul after a time, and failure will be the result. But in treating abscesses that are obscinate in healing, animal charcoal finely pulverized and worked well into the cotton placed into the canal for treatment will often succeed, and I have not been without it in my operating-case for many years. It is only another resource when the common ones fail.—W. H. JACKSON, D.D.S.

Cosmos.

Abstracts of British & Foreign Journals.

THE GERMAN JOURNALS.

To the April issue of the *Vierteljahrsschrift für Zahnheilkunde* Dr. L. A. WEIL, of Munich, contributes an interesting article on HYPERPLASIA OF THE CEMENTUM, a term which he regards as being more generic than either "Hyperostosis" or "Exostosis." Hyperplasia would include both Hyperostosis (plane-like growth,) and Exostosis (a circumscribed new formation of bone). He divides cement-hyperplasia into two main classes.

I. Those which develop during or immediately after the formation of the normal cementum. These are always examples of Hyperostosis, and are most commonly found in upper molars where the roots have been fused together by overgrowth of the cementum. It is also met with in bicuspids and rarely may be found joining the roots of adjacent front teeth together. It appears to be due to an excessive activity in development of cementum during the formative period, for which no reason can be assigned.

II. Hyperplasia of pathological origin occurring around diseased teeth. Such hyperplasia occurs generally as exostoses, and differs from normal cementum in being whiter and more opaque and in having not a smooth, but an uneven surface. It is usually found at the apex, but may occur at any part of the root. The most common situation is at the roots of upper molars and often there has been some Hyperostosis of the cementum during the development of the tooth ; it does not occur on temporary nor on developing permanent teeth. Dr. Weil regards chronic irritation as being the cause of this condition, slow caries, overlapping fillings or tartar around the cervical edge, the absence of its opposing tooth or the presence of one pressing on it in an abnormal manner. He believes the pulp must be healthy, or at most irritated for hyperplasia of the cement to occur, as otherwise he believes the essential irritation conducted by the nerves and through the dentinal fibrils would be absent. From a diagnostic point of view he lays stress on noticing the obliteration of the normal ridges on the alveolus, taken with negative signs of other causes to

account for the trouble. He calls attention to the fact that the one treatment so far advocated is extraction, he has however, saved one tooth, so affected, by destroying the pulp and then drilling up and through the root canals, corrosive paste was then applied till, he believes, the little nerve twigs which run towards the root membrane were destroyed.

In the same Journal Dr. JULIUS FESSLER writes on "VARIOUS SEPTIC PROCESSES STARTED BY INFECTION FROM THE MOUTH." Dr. Fessler points out that the antiseptic treatment of cutaneous wounds has enabled us to guard the body from the entrance of germs through these portals, but there still remain the mucous membrane of the various body cavities, through wounds or abrasions of which germs may still find ingress. As regards the mouth these micro-organisms may enter in either of three ways.

1. By wounds (small or large) of its mucous membrane.
2. Through gangrenous tooth-pulps.
3. By the passage of septic matter from it either into the digestive or respiratory organs.

With regard to septic infection through extraction wounds, he says :—"The belief is very prevalent that the forceps have been unclean, and so have led to these evil consequences. But this is not usually so. Of course it is the forceps which have inflicted the wound, but this wound merely served as an entrance for germs already present in the mouth or introduced with decomposing food. We all know in what a disgusting state is the mouth of some patients ; the unpleasant odour of the breath, which often is taken for a sign of a disordered stomach, has its real origin in the germs of carious tooth remains.

Dr. Fessler has collected together a number of more or less severe consequences following on septic processes in the mouth; we can only quote one, and that, one which had come under his own personal observation. A healthy girl, of 19, had several carious, but not abscessed, teeth extracted under an anæsthetic, there was a little hæmorrhage after, but the next day she had recovered perfectly, though her breath was foul. Five days later, Oct. 4th, she complained of a stabbing pain in the region of the left shoulder-blade. There was slight cough but no expectoration. The odour still emanated from the wound in the mouth, but there were no signs of inflammation. On the night of Oct 7th, she was restless and sleepless, and towards morning had a rigour, with acute stabbing pains

in the chest. A defined pneumonic patch was diagnosed, backwards from the left shoulder-blade, with dry pleurisy. There was only a slight, colourless, tenacious expectoration, but frequent painful cough. Temp. at night over 102° F. Night sweats set in about Oct 14th. The mouth had healed and the odour disappeared. About this time the temperature began to fall and the bronchial breathing was mixed with redux crepitations. But a pneumonic spum was never present. The following day the temperature again rose to over 102° F. pulse 110 to 120—night sweats—diarrhoea. Thoughts were directed as to whether it was a case of acute phthisis, but no tubercle-bacilli could be found in the sputum. On Oct. 22nd, there was a marked increase in the symptoms, and these leading to the idea that fluid was present in the dull area which reached to the middle of the scapula, it was aspirated a thin, greenish yellow, mal-odourous fluid found. Resection of the right rib and drainage of the empyematous cavity was practised, the symptoms subsided and the patient recovered. This was evidently a case of the passage of germs from the wound in the mouth into the lung followed by a localized pneumonia and this by an empyema. The absence of a history of long continued trouble in the mouth and the early onset of symptoms after the operation is against this being a case of septic absorption by the blood or lymph streams. Whilst the absence of symptoms after the narcosis negatives its being due to swallowing blood or a root of a tooth during the administration of the anæsthetic.

In the same Journal, are DR. MILLER's article on "CARIES OF A REPLANTED TOOTH" and DR. ARKÖVY's "ON AMALGAM CROWNS AND CONTOURS" but both these have already appeared in our pages. DR. ANTOINE also describes his year of study in the University of Pennsylvania Dental Department which is complimentary except as regards the method of practising and teaching (or rather non-teaching) of extracting teeth on which his strictures are severe.

In the April number of the *Correspondenz-Blatt für Zahnärzte* the first article is that of Mr. Colyer on "The Introduction of Gold-fillings" which appeared in these columns last year. We however notice that no acknowledgment is made to us, of which we need only remark, that this is surely peculiar!

In the *Zahntechnische Reform*, No. 1, 1891, W. Schmidt, of Vienna, writes on some of the anatomical points to be noticed in making artificial dentures. Paul Zander-Mayon describes his method of TAKING IMPRESSIONS WITH BLACK GUTTA-PERCHA, which he looks upon as being specially adapted for obtaining models of lower edentulous jaws, in which the alveolar processes have been absorbed. He first takes an impression in some other material, and obtains a plaster model, a wire frame-work is made, which is covered with vulcanite so as to form a cup accurately fitting this model. A thin layer of black gutta-percha is spread over this, and after softening in hot water the impression is taken. The thinness of this layer lessens the contraction which all gutta-percha undergoes on cooling, though this is less with black than with other gutta-percha, and moreover, is lessened by the material being used a time or two. He smoothes the edges with red hot steel, and removed the burnt material by rubbing with benzine.

In No. 2 of this Journal, there is told a curious case in which an Arthur Richter, a dentist, gave up his house and went next door. To the old house a notice of removal was fixed. Another dentist, also a Richter, took the house, and before long the notice of removal was taken down, and Arthur Richter believed his patients were being misdirected and misinformed by the second Richter. He therefore, brought the case before the courts, and the accused was convicted and sentenced to £7 10 fine, or 15 days.

THE *Deutsche Monatsschrift für Zahnheilkunde*, for May, 1891, contains an article on BROMIDE OF ETHYL, by Dr. JULIUS FESSLER, of Munich, which is chiefly a record of the cases in which he has used the drug. There is also an article by PAUL DE TERRA, of Zurich, on "SCHLAFGAS, AND MY EXPERIENCE WITH SAME." He states that the two objections which have been brought against the use of the mixture of nitrous oxide gas and oxygen are:—That it does not completely anæsthetize, and the cost of the apparatus. With regard to the first point, De Terra regards a condition of analgesia in which, though conscious of all that is going on

around, the patient feels a pain, to be quite as good as a condition of complete anæsthesia. In most cases of simple extractions he is content with this state of analgesia, but should complete anæsthesia be called for, as, for instance, during parturition, it is quite practical to produce it with Schalfgas. De Terra recalls the fact that nitrous oxide gas has been administered in such a number of cases with so few deaths, but that there are still some cases of heart and lung disease in which the heightened blood pressure induced by pure gas, rather contra-indicates its use. The admixture of oxygen with nitrous oxide does away with this increase of blood-pressure. It has been urged against the use of this mixture that it is contrary to reason to administer a drug and its antidote at the same time. But this indicates an acceptance of Hermann's view that nitrous oxide acts solely by withdrawing oxygen from the blood, a view which is not held by many and which is negatived by the experiments with Schlafgas, which have been made by Hillischer and others. With regard to the objection as regards cost of apparatus, this was undoubtedly the case in Paul Bert's original experiments, where it was held to be essential that the mixture should be administered under pressure, but this has long ago been shown to be unnecessary, and now the apparatus is but little more costly than is that for the administration of pure gas. De Terra prefers to make his own gas and oxygen, and the two are mixed at the face piece. He much prefers doing so to using a ready made mixture, being of Hillischer's opinion that in the power of altering the per centage of O and NO₂, according to the need of the patient lies the ideal of Schlafgas. He then gives particulars of 300 cases. The average time till anæsthesia was complete was two minutes, and from this till the patient was fully awake the average was twenty-five seconds. He prefers to begin with a 20 p.c. mixture of oxygen which he reduced to 10 p. c. towards the end of its administration.

Of the two remaining papers one is by SCHELLER, of Warsaw, in which he speaks well of the use of pure æthyl-chlorid as a local anæsthetic, both for extraction of teeth, removal of nerves, and the excavation of sensitive dentine. The other is only a note by GÜNGERICH, of Hildesheim, stating that the firm of Miller, Berlin, are going to put teeth upon the market, with porcelain roots for implantation; at first they will only make bicuspid.

THE FORMATION OF ENAMEL.

BY R. R. ANDREWS, D.D.S.

In 1888, I had the honour to read a paper before the Odontological Society of Pennsylvania ; my subject was " The Development on the Dentine." In my paper I called special attention to the formation of that peculiar layer which is everywhere found between what was fully calcified dentine and the pulp-tissue from which it is formed. It is found in teeth that have been decalcified by the action of weak acid. This issue, which is hyaline in appearance, was, I stated, formed from minute globular bodies that were seen to be in the odontoblasts : they have the appearance, of fat-globules, but they are not fat. They are also seen on the surface of the layer, where, by coalescing or merging into each other, they formed large globular masses, and these globular masses coalescing formed the layer of tissue to which Professor Harting has given the name calcoglobulin. It is by further impregnation of lime to become the fully calcified basis substance.

I have so far modified my views since reading this paper as to now believe that the odontoblasts, in forming the matrix of the dentine, are only concerned in giving out minute globular bodies, which form the layer of calcoglobulin, not being themselves any part of the matrix. I still hold that the fibres within the tubes are formed from a separate cell deeper in the pulp-tissue, whose processes pass in through the protoplasmic mass of the odontoblasts, and thence into the dentinal tubules of the formed dentine, or, in other words, that the basis substance is formed by a deposit of minute globular bodies, and not by a direct change of the protoplasm of the cells.

This subject proved so interesting to me that I turned my attention to the investigation of the formation and calcification of enamel. My specimens were freshly prepared to show the tissue as near life as possible. My method is somewhat different from those used heretofore. I take the forming teeth from the jaws at or nearly the time of birth, while the tissue is still warm and moist. They are then placed in a one-half of one-per-cent. solution of chromic acid, and this I changed three times daily for three or four days. The edges of the calcified tissues were then found to be sufficiently softened to make a number of thin sections. I first wash the teeth

in distilled water, and then place them in a solution of gum-arabic for several hours. Alcohol is used to take out the water, and they are embedded in a preparation of paraffin and lard, which has been poured into a convenient mould, and they are, when cool, ready for section cutting.

The microtome which I use has this advantage over others : the tissue and knife are both under fluid when the sections are cut, and as they are cut they float off and remain in the fluid until they are taken up for examination. I cut until the tissue which has not been decalcified is reached, and each cutting ruins the edge of my knife ; but I have the satisfaction of working as near life as I can with my present knowledge. After cutting, the sections are examined, and those which I think are worth keeping are placed in distilled water for a short time to dissolve out the gum, and then are mounted in glycerine jelly. By this simple method I avoid shrinking or shrivelling the tissues, as tissues are when they are kept a long time in acids, in absolute alcohol, oil of cloves, and other reagents, or by the drying processes that prepare them for the beautiful serial sections that are turned out from many of our laboratories, where the Thoma microtome is used.

I regard the generally accepted theory of the conversion of the cells of the internal epithelium of the enamel organ, the ameloblasts, into the rods or fibres of the enamel as an erroneous one, from the fact that I have often observed in developing teeth a folding-in upon itself of that tissue which is to become enamel, which is found between the formed dentine and the cells of the internal epithelium of the enamel organ. This folded layer is undoubtedly a band of uncalcified tissue, and seems to be formed in these folds, that it may be taken up by the growth of the dentine germ during its rapid growth.

I have quite a number of specimens showing the folding-in of this tissue, mostly from pigs' embryos at birth, and this appearance is so marked that it is impossible for me to give any other interpretation.

This peculiar layer has received attention from most of the investigators. Professor Huxley has stated that it is possible to raise a continual sheet of tissue or membrane from the surface of developing enamel. He concludes that this is the original *membrana præformativa* of the older writers, and that this eventually becomes Nasmyth's membrane. He believes that the enamel was developed without any direct action of the

enamel organ, because a membrane separated the two. Tomes believes that this sheet or membrane is produced solely by the destructive action or reagents. Markson believed that it was nothing more than the part of the papilla first calcified.

Dr. Lionel Beale denied the existence of any membrane between the enamel and the enamel-cells. Robin and Magitot offer an explanation of the appearance of such a membrane by stating that the formative pulp is rich in a clear substance of gelatinous consistence: that it is dense towards the surface, where it forms a matrix for the ameloblasts and projects beyond them, so as to look in sections like a sort of varnish, between the enamel and the cells. Being dense near the surface it may become corrugated and look like a folded or torn membrane.

Frey states that as the calcification of dentine is commencing, the surface of the latter is covered with already hardened but still short, prisms. Not seldom we encounter appearances as if over these prisms there was superimposed a special cuticle the so-called membrana præformativa. Such a membrane does not in reality exist, however, and the whole is only a deceptive appearance produced by the youngest layer of enamel which is undergoing development, after the decalcification of the whole from the fully-formed tissue beneath.

Klein says that the distal extremity of the enamel cells, that is the one next the dentine, elongates, and this elongation he calls an increment, and tells us that this is directly converted into enamel. He states that the increment of the enamel-cells and the conversion into enamel probably occur successively, and this he thinks to be the cause of the striations across the enamel rods. He states that the enamel-cells, like all epithelial cells, are separated from one another by a homogenous interstitial substance, and as he finds this substance between newly-formed enamel-rods, he claims that it is by conversion that one is formed from the other. He says that in the enamel of a developing tooth that interstitial substance is always found to be larger in amount than the fully-formed organ, and this appearance I have repeatedly noticed myself.

Dr. Sudduth, in his article on amelification, in the *American System of Dentistry*, gives very little if any attention to the existence of this layer found between the calcified and the organic tissue. He speaks of the substance found between the rods of young enamel as a basis substance composed of calglobulin; he calls attention to important facts which I myself

have noticed, and that is, wherever enamel is forming the stellate reticulum has disappeared, and the stratum intermedium seems directly in contact with the capillary of the connective tissue without. It seems essential that capillary vessels should thus be in indirect contact with enamel-cells before the processes of calcification can be commenced. Dr. Sudduth gives not a little space in his chapter on amelification to prove that the enamel which he rightly calls a coat of mail, and shell, are analogous structures.

There has very recently fallen into my hands, translated by a friend, an article by Dr. Graf Spee, from the *Biologisches Centralblatt*, "On the First Processes of the Deposition of the Enamel." In it he calls the minute spherical bodies, which I call calcospherites, "enamel drops." I will quote a part of his most interesting paper :

"A coarsely granular appearance of the enamel-forming cell has been often observed. Annel rightly claims to have seen highly refractive granules in the body of the cells, and, according to my experience, these granules are regularly to be found in enamel-forming cells. The abundant appearances of the granules at the time of the formation of the enamel and their entire absence at earlier stages, is an indication that the granules are an enamel substance. I call them enamel drops. Following up their future confirms their appearance. I saw the enamel drops appear only in the half of the enamel cells which is turned towards the pulp, and within this half at first in the end which rests on the dentine ; afterwards farther up in the cell, but not quite up to the region of its nucleus. Many of them were so small as to be scarcely measurable. They are almost always spherical.

"Great numbers of them are collected at the periphery, and appear here either to be completely arranged or to fuse together. At any rate, one soon finds that on the dentine or on the already formed enamel layer there are no longer isolated or enamel drops, but a more homogeneous mass. The lower part of the cell contains the larger enamel drops, which merge without sharp boundaries into the substance of the enamel fibres. This then appears as a part of the enamel-cell in which the originally isolated enamel drops have run together into a continuous mass. The growth of the enamel-rod, once begun, appears to take place by the addition of new enamel drops.

"The product of the enamel-cells first to be found is, there-

fore, not the chemically definite enamel, but an organic precursor of it, which is, perhaps, horn-like, since even the enamel cap which is not yet impregnated with salts, has a horny appearance. When there is a formation of earthy deposits under the influence of cells, the process is of such a nature that at first an organic production is formed, which in turn has the power of easily forming in soluble compounds with organic salts, and thus become hardened."

This "horn-like" substance which Dr. Graf Spee found, was, I believe, the changed tissue calcoglobulin to which I have alrerdy alluded.

It may not be uninteresting at this point to quote from Quain's Anatomy, vol. ii. p. 71, a few words about other tissues formed from globules. In speaking of the formation of elastic fibres, the writer says, "These, as shown by Ranvier, first appear in the form of granules or globules, which subsequently become fused together, end to end, and are not at any time connected with cells. In elastic cartilage the granules or globules make their appearance, it is true, in the immediate neighbourhood of the cartilage cells, but although this renders it probable that the deposition of the globules is influenced by the cells, it does not prove that they are formed by a direct conversion of the cell protoplasm. Indeed, the subsequent extension of these fibres into those parts of the matrix which were previously clear of them, and in which no such direct conversion of cell protoplasm seems possible, it is a strong argument in favour of the deposition hypothesis. The view which supposes that a direct conversion of the protoplasm of the connective-tissue cell takes place into fibres both white and elastic has of late years been widely adopted, but it seems to rest less upon observation than upon a desire to interpret the facts in accordance with the conceptions of Beale and M. Schultze, according to which every part of an organized body consists either of protoplasm (formative matter) or of material which has been protoplasm (formed material), and the idea of a deposition or change occurring outside the cells in the intercellular substance is excluded. But it is not difficult to show that a formation of fibres may occur in soft substances in the animal organism independently of the direct agency of cells, although the material for such formation may be furnished by cells. Thus in those calenterate animals in which a low form of connective tissue first makes its appearance, this is distinguished by

a total absence of cellular elements, the ground substance being first developed and the fibres being formed in it. Again, the fibres of the shell membrane of the bird's egg are certainly not formed by the direct conversion of the protoplasm of the cells, although it is probably in matter secreted by those cells, and through their agency, that the deposit occurs in a fibrous form.

To the dental histologist, enamel is, perhaps, the most difficult subject he is called upon to investigate. While there are many who have shown us the coarser morphology of the enamel organ, there are very few who have had anything to say about the finer processes in the depositions of the enamel. Perhaps on account of the difficulties met with, the subject has received insufficient investigation. The ordinary methods of the laboratories do not give us good results with this tissue. It comes to us so shrunken as to be of little use to satisfactorily demonstrate what the minute bodies, miscalled granules, within the substance of the enamel-cells really are. The shrinking of the cells is caused by the reagents which have been used in their preparation.

The so-called calcareous granules are minute calcospherites, —they are most spherical. The *nucleus* of the enamel cell is not always to be found farthest from the calcifying tissue, as authorities inform us. I have sections showing it midway between the two ends of the cell, some being near the layer next the forming enamel, surrounded by very many minute listening bodies. Between the cell and the calcified material I found the layer of calcoglobulin. It is of the utmost significance to us, because within its substance the first formation of the rods of the enamel takes place. Huxley was right in crediting it with the importance he gave it, but wrong in calling it a membrane.

It is a tissue formed by the globular contents of the enamel-cells, with a portion of the cell protoplasm, a cement substance. In it the globules are arranged in columns and become the rods. This is the point I would emphasize, showing, as I believe it does, the methods of nature in forming rods, independent of the cells themselves. By a further process, these globules or masses become calcified, and a part of the already calcified rods. I have studied this layer from several hundred sections, in studying the formation of dentine as well as of the enamel.

In the dentine we have a formative pulp, full of nerve

bundles, fibres, and capillaries, and, as a consequence, its calcification gives us a matrix full of organic tissue. In the enamel organ there is an almost entire absence of vessels. Its calcification gives us a matrix almost without organic tissue. Enamel in this early age presents the best possible condition to note the presence of a reticulum of living matter if any were present; but with the best objectives at my command and with all the care that I could give to the subject, I have failed to find the appearance of anything of the kind.

In tearing off portions of the layer with needles, I have found the uncovered calcified matrix to have everywhere over its surface myriads of globular forms resting in a semifluid, the so-called protoplasmic substance. The cells of the internal epithelium of the enamel organ at the time when calcification is commencing are, if they have been carefully prepared as I have already said, found to be full of these minute globules which I believe to be calcospherites. These are given out from the cell into the layer continually, forming, by coalescing, larger globules or masses which will become the rods, and are surrounded by this protoplasmic substance which is to be the cement substance between the rods; the cells of the stratum intermedium above are seen to be in direct contact with the embryonic connective tissue, the stellate reticulum having disappeared from that part.

My sections having been made extremely thin, were not stained, and the photographs may not show with all the clearness I could wish, but I believe they will give an outline, at least, of what I have referred to. Some of the sections illustrate my point so clearly as to be almost diagrammatic; other sections will show that the protoplasmic substance in which the globules or masses are to be seen is forming the cement substance between the young rods. Tissues showing these various transitions are mostly from the teeth of calves at birth, some from human embryos, fifth month, and others from pigs at birth. In making sections of tissue which is only partially decalcified, I have been able to obtain some pictures of young enamel almost as we see it in ground sections. In the rods of these sections it is possible to mark out the outlines of the globules, or masses, from which I believe they are formed.

These globules themselves, before complete decalcification has taken place, consist of that substance which Professor Harting has called calcoglobulin. I do not think that the

substance between the rods is to be considered this tissue, although Professor Suddeth, of Minneapolis, in his article on amelification, gives it this name, which should be applied only to the tissues which are formed from the globules. It may be of interest in connection with this subject to repeat here a very brief description of the experiments of Professor Harting and Mr. Rainie on the action of certain lime salts on albumen. These investigators claim that the experiments give us an explanation of the methods of the calcifying processes of the osseous tissues.

Mr. Rainie found that if carbonate of lime be slowly added to a thick solution of albumen, the resultant salt is in the form of globules laminated in structure like tiny onions; the globules in contact become agglomerated into a certain laminated mass, appearing as if the laminæ in immediate opposition were blended with one another. The globular masses, at one time of mulberry-like form, lose the individuality of their constituent smaller globules, and become smoothed down into a single mass. Mr. Rainie suggests, as an explanation of the laminated structure, that the smaller masses have accumulated into concentric layers which have subsequently coalesced, and in the substitution of the globular for the crystalline form in the salt of lime when in contact with albumen he claims to find a satisfactory explanation of the development of bone, teeth, and shells.

Professor Harting has shown that the albumen left behind, after the treatment of these globules with acid, is no longer ordinary albumen. It is profoundly modified, and has become exceedingly resistant to the action of acids, resembling chitine, the substance of which the hard skins of insects consist, rather than any other body. The small and onion-shaped globular bodies he has named calcospherites, and the layer caused by the coalescing of these, calcoglobulin, as it appears that the lime is held in some sort of chemical combination; for the last traces of lime are retained very obstinately when calcoglobulin is submitted to the action of acids in the same manner as does that layer which is found everywhere on the borderland of calcification between the carefully calcified and the formative tissues.

I would add, then, in conclusion, that I believe,—

First. That the cells of the internal epithelium of the enamel organ, the ameloblasts, contain in the part nearest the calcifying tissue large numbers of minute glistening bodies,

which have been misnamed granules, but which are really calcospherites.

Second. That these minute globules are given out from the enamel-cell into a protoplasmic substance which is on the surface of the first formed layer of dentine, or, if enamel is already formed, on the formed enamel; that here they coalesce and form larger globules or irregular-shaped masses.

Third. That in this condition they form a layer of calcosglobulin. The globules or masses are arranged in columns, independent of the enamel cell.

Fourth. That this layer is really that which the older writers called the membrana præformativa.

Fifth. That the forming rods in this layer calcify and become part of those already calcified, the so-called protoplasmic substance surrounding them becoming the cement substance, as before stated.

THE LATE DR. THOS. W. EVANS.

By T. C. CRAWFORD, *Chicago Tribune.*

A number of paragraphs published in American papers give erroneous details concerning the life of Theodore Evans, an American citizen who recently died in Paris. He was represented as the oldest of a most remarkable Philadelphia family. The Evans family sent out into the business world three boys, but it was the oldest boy who established himself in Washington, where he reached a good business success. The second brother, Theodore Evans, made his fortune both in Europe and this country. But the most successful was the youngest, Dr. Thomas W. Evans, who has lived for forty years as a prominent figure in Paris. His career reads more like a romance than a real history. He left America when he was not more than twenty years old, and went to Europe with the fixed idea of establishing himself there. He was always an apt scholar in everything relating to mechanics. He was a graduated dental surgeon before he went to Europe. He mastered his profession in the broadest sense by also taking a degree in medicine. He went to Europe at a time when

American dentistry was unknown on that side of the water. Dr. Evans said he made up his mind from the first to have as his clients all the royalties of Europe. He has succeeded. To-day there is not a single reigning sovereign, from the Queen of England to the Czar of Russia and Sultan of Turkey, that he has not had in his operating chair. The doctor has also filled a large place in the world of private diplomacy and has gathered together one of the largest fortunes in Paris.

His first notable client was Napoleon III., when Napoleon was merely a claimant. Dr. Evans first became acquainted with the future emperor when he returned to Paris after his exile in London. He obtained the confidence and esteem of Napoleon, and when the latter became president, the confidence was increased. There was no one who was more intimate or who had more influence with the Emperor later on than the quiet, matter-of-fact Dr. Evans. He was in the confidence of the Imperial Government at the time Paris was made over by Baron Haussmann. He had confidence in the splendid future of the city and bought largely of real estate in the direction of the improvements. It was he who helped the Emperor design and carry out the vast improvements around the park of the Bois de Boulogne. The doctor's investments in the neighbourhood of this now fashionable park had made him a many times millionaire. Land bought by him in the early days of the régime for 30 francs the square meter, cannot now be obtained for less than 1,000 francs.

The mother of the Countess of Montijo was first a client and then a friend of Dr. Evans. This mother sent her daughter to Paris as a schoolgirl. The young Spanish beauty spent all of her fete days at the house of Dr. Evans. It was Dr. Evans himself who took her to a ball given by Napoleon when President. The young lady had heard of the ball and was very anxious to go. Her mother had no invitation. As she was in moderate circumstances and unknown in the Paris world of fashion Dr. Evans went to the President himself and asked for an invitation for his fair protégé. It was at this ball that she was formally presented to the President. This presentation was made by Dr. Evans. The President of the French Republic was then so much struck by this young lady's beauty that he singled her out for the most marked attention. He danced with the young stranger several times. This attention made a marked sensation. The young lady the

next day was a noted character. This acquaintance begun at the ball led afterward to the marriage.

The intimate relations between the Emperor and Dr. Evans enabled the latter to perform a great service to this country. No account of it has ever been published.

During the darkest days of our war, Emperor Napoleon was anxious to recognize the Southern Confederacy. He had fully made up his mind to this, and had entered into correspondence with the English Prime Minister upon the subject to secure the cooperation of his country. Dr. Evans, who is one of the most staunch and patriotic Americans, insisted upon the Emperor making a delay of a few weeks at least. The doctor said :

"I will go to America and see Mr. Lincoln, I will visit Washington and learn the real truth of the situation. I know that the North must win. I believe that I can bring back to you evidence to prove this. You know that I have never deceived you and that you can trust my report."

The Emperor as a great concession to the demands of his old friend agreed to the delay. Dr. Evans visited Washington, saw Mr. Lincoln, and obtained such assurances that he was satisfied that he could convince the Emperor that the Southern Confederacy should not be recognized. Fortunately the North had such tremendous victories during the doctor's absence from France that the Emperor was willing upon the doctor's return to drop the whole matter. He placed in the doctor's hands at that time the correspondence which he had had with the English Foreign Office. If the famous doctor ever publishes his memoirs, these letters will make a most interesting chapter.

The German imperial family has treated Dr. Evans upon a footing of intimacy for a number of years. The old Emperor was always very much attached to Dr. Evans. During the Franco-Prussian war Dr. Evans organized an ambulance service. This ambulance service, carried on at his own expense did incalculable good, he had been for a long time an object of suspicion after he assisted in the flight of the Empress. The plucky doctor used to ride down from his house to his office even in those days with a rifle sticking out of the window of his coupe. The threats made at the time on account of his saving the life of the Empress from the mob soon gave way for thanks when the public witnessed the effects of the humane service established by him for the benefit of the wounded. At

the close of the war he was a constant peacemaker and mediator between the two countries. After peace was settled the German Emperor sent for him and offered to bestow upon him the order of the Black Eagle, one of the highest at his command. The doctor hesitated. He thought that such a token would hurt him perhaps in the esteem of his French friends, so he gently declined, giving his reasons for the declination. The Emperor then devised a special order, which was to be for him alone, and gave this to him in a personal sense, and so this could not be refused. France has in turn given him the highest rank it has in the Legion of Honor. He is a Grand Commander in that order.

Indeed, to look at the doctor's collection of orders, for he never wears them except on rare occasions, and then but the highest, it makes such decorations look cheap. He has had all of the orders possible to be conferred on him by Germany, Russia, and all the leading countries of Europe. He has over 200 in a cabinet in his library. One of the first jubilee medals struck off for the Queen of England, was sent to him. One of the first mourning medals struck off following the death of the Emperor Frederick, was sent to the doctor. His house is in Avenue Malakoff, constructed with the richness and solidity and actual magnificence of a palace, is filled up from top to bottom with beautiful objects which should grace the future art museums of the National Capital—evidences of the gratitude and esteem of his royal patients and friends. In one of his cabinets is a magnificently jewelled and ornamented watch. It was given to the doctor by the Duchess of Baden. It was so handsome that he did not venture to wear it, but placed it in his cabinet of silver treasures. The next time he met the Duchess he happened by chance to pull out his watch and she exclaimed at once because he was not wearing the one she gave him. His reply was that it was too fine to be worn. Thereupon she had a plain watch ordered, and that is the watch the doctor now carries.

The doctor was called in when the Crown Prince Frederick was taken to San Remo. The doctor was not summoned as a medical attendant, but as a friend. He remained there during the Prince's stay. I happened to be at San Remo at the time, and it was there I became really acquainted with the famous doctor. Every day he received dispatches from the Empress Augusta. It was he who sent the private advices constantly of the condition of her son upon the terrible day

when it was thought that the Crown Prince would strangle when the operation of tracheotomy was decided upon. There was no one in the little Italian village skilful enough to make the silver tube necessary to be used after the operation was performed. It was here that the skilled hand of the American doctor was called into play.

I walked down with him to a little jeweller's office in San Remo and saw him put on his workman's apron and began with a blowpipe and hammer upon a five-franc piece. He worked there all night and in the morning a beautifully made silver tube was ready and the life of the Prince was prolonged, where suffocation would probably have set in within the next twenty-four hours. There was no mention made of Dr. Evans in the story of this operation. In the English papers it was Dr. Morell Mackenzie who did everything even to the making of the silver tube, which no one but a very skilful man with a natural turn for mechanics could have made with the simple materials found in a country jeweller's shop.

Dr. Thomas Evans is of medium height and inclined to be stout. He has a large head. His hair is still thick and is worn in a careless curl in mass swept from his forehead. His forehead is high and full. His eyes are a blue-grey, deep set; his nose is a large Roman. A moustache and long side whiskers set off his round, plump face. He is in the neighbourhood of about 60 years of age. He has no children. His wife is a tall, white-haired, aristocratic looking lady, who presides with gracious dignity in the great house on Avenue Malakoff. The house is the centre of the best section of the American colony. American visitors of standing always receive warm welcomes from the doctor and his wife. Although the doctor has been away from home for nearly forty years, he is an always enthusiastic American.

T. C. CRAWFORD, *Chicago Tribune.*

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Ordinary Monthly Meeting, May 4th, 1891. Mr. S. J. Hutchinson, M.R.C.S., L.D.S., *President*, in the chair.

The Minutes of the last meeting having been read and confirmed,

Mr. C. A. CLARK signed the Obligation Book, and was formally admitted by the President.

Messrs. MAUDSLEY HOWKINS and STEPHEN COXON, having signed the Obligation Forms, were duly declared non-resident members.

The following Nominations were read before the Society ; John William Saville, L.D.S., Eng., 4, Bedford Circus, Exeter ; Carl Shelling, L.D.S., Eng., 7, Montpelier Row, Blackheath, S.E.

The following gentleman was balloted for and elected a resident member:—H. Beadnell Gill, L.D.S., Eng., Silverdale, Hawke Road, Upper Norwood, S.E.

The PRESIDENT then called upon Mr. James Stocken for his communication.

Mr. JAMES STOCKEN contributed a casual communication on a case of "Absorption of Fangs of Permanent Teeth." The lower wisdom tooth shown was from a patient between forty and fifty years of age. He came to Mr. Stocken complaining of inability to bite upon the tooth without discomfort. On examination he found it very loose and judged it attacked by Rigg's disease ; there being no opposing tooth he advised its removal ; upon applying the forceps he found no resistance, in fact the fangs were entirely absorbed. By examination he fancied he could detect giant cells upon its surface, this was most probably an error ; there was no bleeding, neither was there crowding. There was a fringe of tartar around the neck and also caries on the buccal surface, these two conditions may have led to irritation and subsequent absorption of the fangs. From one of the openings to the pulp chamber protruded what appeared to be a nerve fibre. This case clearly proved (if proof were needed) that absorption of the fangs of the teeth may take place quite independently of pressure arising from the development of a succession tooth or from pressure from an approximate tooth, as both these conditions were absent. Another case of absorption of the fang of a permanent tooth was that of an upper incisor ; there was evidence to indicate that this has been primarily caused by periostitis.

Mr. Stocken also exhibited and presented to the Society a deciduous tooth of a horse ; it was given to him by a patient who said his horse was "off his feed," and one day as he stood beside the horse, he heard something drop from the animal's mouth and upon picking it up found it to be its milk tooth. The horse was about three years old, the tooth a temporary

molar, somewhat triangular in form, the under-surface presenting several cup-shaped depressions, the upper surface showed considerable attrition, the "marks" being almost almost obliterated, and representing an agglomeration of worn-down cusps, the lines of demarcation being of a crescent form.

The PRESIDENT remarked that Mr. Stocken's specimens were very interesting, and would be passed round ; the lower molar was specially interesting and he thought Mr. Stocken's explanation of the cause of absorption was correct. The Society would gladly accept the tooth of the horse for the museum. He would now call upon Mr. J. Bland Sutton.

Mr. J. BLAND SUTTON read a communication on a very large odontome from a horse. The specimen had been for a long time in the Museum of the Royal Veterinary College, London, and in company with several similar specimens, was simply described in the catalogue as "a tumour composed of dental tissues from a horse." The odontome is of peculiar shape and in its general contour recalls in a striking manner the brain of a horse: this is no doubt the explanation of the rumour at one time current, to the effect that it was really an ossified brain. In order to make this tale appear more circumstantial, a hole in its side was pointed out as the spot where the knacker had made an attempt upon this invulnerable organ with the pole-axe. The tumour itself was sufficiently remarkable without any assistance of this character. It weighed seventy ounces, and was as far as Mr. Sutton knew, the largest odontome from a horse on record. On section it had a laminated appearance, and microscopically differed from any kind of hard tumour he had hitherto examined. Sections of the tumours had been prepared by Mr. Charters White with his accustomed skill, and by an ingenuous method he had succeeded in injecting the vascular canals with a coloured fluid. This method demonstrated, what would have scarcely been suspected, that this extremely dense tumour was very vascular. Its chief structural peculiarity was the presence, in enormous numbers, of large richly branched lacunæ. Mr. Sutton had been unable to cut it up for microscopical purposes so freely as could be desired, but he had seen sufficient to justify him in expressing the opinion that it was an enormous cementoma resulting from the ossification of an enormously thickened dental follicle.

The PRESIDENT felt sure that the Society would agree in

thanking Mr. Bland Sutton for bringing forward the very interesting tumour and his lucid description of it. He would like to ask whether there was any sign whatever of a tooth in relation to this odontome.

Mr. W. A. MAGGS wished to ask Mr. Bland Sutton why he called the tumour an odontome instead of an ivory exostosis, especially as he had said it contained a great quantity of canaliculi, &c.

Mr. J. BLAND SUTTON, in reply said that as to whether there were any elementary teeth, there was just a possibility as there was a patch of dentine in one place, otherwise there was no appearance of anything, and as the odontome was not his own property, the owner might object to his making sections of it. With reference to Mr. Maggs' question, he thought it would be entirely retrograde to call it an ivory exostosis; surgeons who were less informed upon the subject than dentists were continually doing so, but its laminated character and structure stamped it as an odontome. An ivory exostosis should contain converging canals and nothing more than large lacunæ without any definite arrangement.

The PRESIDENT then called upon Mr. Morton Smale, who read a communication. He said his first case was a very simple one, but perhaps it might interest members of the Society. He would pass the models round and describe the points while the specimens were being handled. The models showed an abnormality on the right side, the upper molars were grown down below the normal bite, while their opponents were only erupted to be flush with the gum. As no true meeting of the teeth occurred, the downgrowth of the upper teeth could not account for the want of growth of the lower. Careful examination of the neighbouring teeth gave no clue to the mystery of the non-growth of the right lower molars. The patient presented herself that the first lower molar on that side might, as it was giving pain, although not decayed, be extracted if possible. Before Mr. Smale saw her, three distinct attempts had been made to remove it, but unsuccessfully, which no doubt accounted for his being able to extract it, although the operation even then was performed with some difficulty. Upon examination of the mouth it seemed probable that some exostosis existed, and this, as the extracted tooth, which was handed round, showed was actually the case; but while this accounted for the difficulty experienced in its removal, it in no sense explained the abnormality of eruption.

The second case was a patient aged twenty-seven, who came under his care in 1887, anxious that some badly decayed incisors might be extracted and replaced by artificial substitutes. On examination the mouth was found to be firmly closed, and it was impossible to get a model of the mouth even had it been possible to remove the offending teeth.

The patient gave the following history :—When three and a half years old she fell from a window fourteen feet from the ground upon a brick coping. She was able to get up and run round to the front door of the house. No bruise or wound was to be found, two teeth were knocked out, and there was slight bleeding from the ear. The doctor who was called in attendance diagnosed it as fracture of the base of the skull. She was kept in bed for a week and then allowed to run about as usual. The mother noticed she had difficulty in eating, and on consulting the doctor with regard to this, ten months subsequent to the accident, he advised a consultation with an eminent surgeon. After the interview the mother was advised to let things alone until the teeth became troublesome, and to preserve with graduated wedges. A few years later she was taken to see a well-known dentist who advised India rubber wedges instead of wooden ones. While in 1873 another dentist was consulted who found it necessary to remove some teeth, and after wedging perseveringly for several weeks chloroform was administered, and some teeth extracted, but no good resulted so far as movement of the jaw was concerned. From this time the patient appears to have ceased all efforts and the jaw became fixed, it being only possible for food to be taken through an aperture produced by decayed teeth.

In reading this account by the patient two or three things were worthy of notice.

1. It seems highly improbable that there was a fracture through the base of the skull at the time of the accident, or the patient would hardly have been running about at the end of a week. The bleeding might be due to injury of the membrana tympani, or to injury to the glenoid cavity or some surrounding tissues.

2. When it was found possible to obtain movement and open the jaw by gradual wedging would it not have been advisable in a young healthy person to have ruptured the adhesions forcibly, and then used the wedges to keep from cicatrisation? Later when ankylosis was firmly established such a course was clearly impossible.

When the patient presented herself in 1887 she certainly was in a sad plight. The mouth, as above stated, could not be opened at all. It was impossible for her to go into society for she could neither eat nor talk like an ordinary individual, and being of a highly sensitive organization felt the deformity very much. Mr. Smale advised, therefore, before anything else was done that she should see Mr. Christopher Heath with a view to his forming a false joint upon the right hand side, it being possible to feel slight lateral movement in the left articulation. Mr. Heath agreed to this and the operation was performed. The operation carried out in a precisely similar case is thus described by Mr. Heath:—"I made," says Mr. Heath, "a small incision within the mouth immediately above the last molar tooth, and having passed a steel director to clear the way, I was able to push an Adams' saw beneath the masseter and to divide the ramus horizontally. No hæmorrhage from the inferior dental artery occurred."

The immediate result of this was successful, the patient was able at once to open her mouth until two fingers could be easily got between the front teeth. The teeth were extracted. a denture made, and a new era of life opened to the patient.

This case had not been reported before, for the reason that it seemed desirable that some years should elapse to see that the result had been permanently successful. This had not altogether been the case, for last week when the patient presented herself she could not open her mouth more than a $\frac{1}{4}$ of an inch instead of $1\frac{1}{4}$ inch, which she could do after the operation, and she was now using a screw gag every day to stretch the adhesions that had formed, but it seemed highly probable that it might be necessary to place the patient under an anæsthetic and rupture the adhesions forcibly. The patient admits that she had felt for some time that gradually it was becoming more difficult to open her mouth, until she could only get the tip of her finger between her front teeth. In cases of this sort it was of the utmost importance that forcible movement should be persevered with after the operation, great care being taken by the patient that the mouth be not allowed to become fixed again.

Mr. Smale said he thought an apology was due for troubling the Society with so very ordinary a case, and should not have done so had it not been that in spite of this patient having seen three dentists and two surgeons she had lived from three and a half to thirty-two without this operation having been

suggested to either her parents or herself, and it seemed possibly useful that the attention of the members might be called to a case of this sort, which in the ordinary way is only reported to the Medical Societies. Dr. Dudley Buxton who, Mr. Smale believed, had assisted at the operation, and who was present that evening, might remember some further facts about the case.

The PRESIDENT said that they were indebted to Mr. Smale for bringing forward the communication, and they would be glad to hear Dr. Dudley Buxton upon the subject.

Dr. DUDLEY BUXTON said that it appeared to him that after the very full way in which Mr. Smale had described the whole proceeding, it was hardly necessary for him (Dr. Buxton) to go into particulars, because if he did so he must traverse the ground already gone over very carefully. He remembered Mr. Smale's case, and that the division of the jaw proved a tough job, and he also remembered the case read from Mr. Heath's lectures, having in both instances administered the chloroform. In that case both he and Mr. Heath were anxious that it should be successful, as both from Mr. Heath's point of view and his own it was a case of no ordinary difficulty. Mr. Smale had spoken of it as an ordinary case, but Dr. Buxton was not of that opinion. Esmarch, of Kiel, Rizzoli, of Bologna, Spanton, and other surgeons had described cases and operations for their relief, but Dr. Buxton thought that in the literature of the dental profession the matter had been passed over with little or no notice. He might say that in the case of the first patient the operation consisted in introducing a fine saw between the masseter and dividing the bone at the level of the last molar, and then by forcibly moving the jaw apart by means of a powerful gag (Heister's), the bone was completely ruptured and the tissue about the bone also torn and stretched. This had been done on two occasions. On the second it was found necessary to pull the jaws more widely apart. On the first Mr. Heath resisted the temptation, deeming it prudent to proceed with caution; on the second considerably more force was employed, and after the bone was separated by the saw, the jaws were moved apart forcibly by means of Heister's gag. In the first operation it was difficult to get any *point d'appui* from which to get any pressure, and some of the teeth were forced out in opening the jaws. There did not seem to be any other point to dilate upon, but Dr. Buxton could only say that the appearance of the

patient before and after the operation spoke most eloquently as to the value of the operation, and he agreed with Mr. Smale that the deepest sympathy could not but be felt for any human being who for so many years had stood in need of such surgical aid as this case required, and that certainly one would be inclined to give the operation a trial in similar circumstances.

Mr. NEWLAND-PEDLEY said the case was very interesting, but one could not help thinking that operations for fixed joint were not exceedingly rare. Esmarch's they were familiar with, but, as in this case, recurrence after the operation frequently took place. Mr. Newland-Pedley remembered they had a case at Guy's in which a boy had ankylosis on both sides of the jaw. In that case a surgical colleague performed excision of the condyles. He believed there were several similar instances of both condyles being removed with permanently beneficial result. Such an operation was not likely to produce deformity.

Mr. HERN wished to ask Mr. Smale whether the immobility was due to the renewing or cicatrisation of the soft tissues.

The PRESIDENT said these cases did not seem so common as Mr. Smale had suggested or they might have expected to hear the personal recollections of similar cases from some other members.

Mr. MORTON SMALE remarked that Dr. Dudley Buxton had said that Mr. Heath found it rather hard work dividing the jaw. This would be accounted for to some extent from the fact that Mr. Heath had also sawn the tooth (exhibited). Mr. Smale wished to say that the patient was distinctly benefited and was quite of opinion that the right thing was done and was very much obliged to Mr. Heath. With regard to the cases Mr. Newland Pedley had referred to, one had read of them but one never heard of the subsequent history. It was unfortunately too common to make haste to announce the success of an operation before sufficient time to elapsed to test the permanency of the relief. Mr. Smale would like to know whether fibrous adhesion did not afterwards take place. It was for this reason that Mr. Smale had delayed the publication of the case he had brought before them. In reply to Mr. Hern, Mr. Smale thought that fibrous tissue was formed between the sawn ends of the bone, but he did not think ossification had taken place. They were able to stretch the opening, and he believed that Mr. Heath still hoped that by means

of a screw gag the patient might be able to open her mouth very considerably at the end of a few weeks, but Mr. Smale was not so sanguine.

Mr. DAVID HEPBURN narrated a case of attrition in the first dentition. The case, unique as far as his personal experience went, was one of "attrition" of the deciduousteeeth, and associated with retarded eruption of the permanent teeth. The child, a boy nearly eight years old, had not shed any of the temporary teeth and there was no signs of the six-year-old molars or other teeth of the permanent series. The temporary teeth as shown by the model (especially the incisors and canines), are worn down almost level to the gum. So much worn indeed that the pink pulps might be distinctly seen through a delicate but highly polished window of dentine. The abrasion of the teeth was most marked in the upper jaw.

The child was a hearty intelligent little fellow ; had been observed to grind the teeth together at night. Mr. Hepburn would say there was some pressure of the frontal bones, but, in this particular case, he was unable to pursue enquiries as to any latent defects in the child's constitution.

Mr. F. J. BENNETT thought it a little remarkable that it was entirely the front part of the mouth that was affected. The first and second molars did not appear to be worn down to any extent : that might be accounted for from the circumstance that the incisors began to be worn down before the eruption of the molars. At any rate, it seemed remarkable that it should have occurred in the front of the mouth. He had seen the first and second temporary molars worn down in that way in children and also the incisors but in the cases he had seen the wearing had always been distributed uniformly.

Mr. C. V. COTTERELL said he proposed to bring before the Society an instrument which he felt sure would be a great boon to all. Batteries, primary and secondary, had been very largely used by all for a motive power for the dental engine, electric mallet, and small electric lamp for the mouth. But every battery failed sooner or later, and his experience was they failed very soon. The convertor which he showed was the idea of Mr. A. B. Woakes, of Harley Street, and was to reduce the electric current as supplied from the mains from 50 to 100 volts to three volts, and from ten ampères to only half an ampère. It is a reversed induction coil. The primary coil, with fine wire and many turns, has a resistance of about 50 ohms. and allows as much electricity to pass as 3-16 c.p.

lamps would require, which is two ampères. The secondary coil contained thicker wire and only a few turns; it had a very much lower electro-motive force (only sixteen volts) but a greater number of ampères, viz., ten. Most cautery burners, lamps, motors, mallets, &c., required less than this, and the current strength, as well as the number of volts, could be conveniently regulated by moving the primary coil. When drawn out the current of the secondary coil has only about three volts and half an ampère; by pushing it home this became gradually increased to sixteen volts and ten ampères. The current could be used for two purposes at the same time, viz., light and cautery or light and motor, as there are two sets of terminals. In order to prevent the electricity being wasted there was a lamp which became incandescent immediately the apparatus was connected with the main, and ceased to give light only after it had been disconnected. He added the patent had been applied for in Great Britain, the United States and Germany, and it was made by R. Schall, of Wigmore Street. Mr. Cotterell very much regretted that the current was not laid on in the Society's rooms, as he would have liked all to have seen the steady way the convertor worked. The convertor could also be employed for the faradic current and so used in tooth extraction.

Mr. C. S. TOMES asked whether Mr. Cotterell meant that the convertor enabled him to utilize the supply from the mains to drive the motor and dental engine, and that the alternating current was transmuted into a continuous current.

Mr. COTTERELL replied that he had not a motor, but Mr. Schall had, and he (Mr. Cotterell) understood that the motor was worked satisfactorily from the mains by means of this convertor. He believed the alternating was changed to a continuous current.

Mr. C. S. TOMES, notwithstanding Mr. Cotterell's reply, felt somewhat sceptical as to whether the convertor would accomplish all that Mr. Cotterell gave it credit for, but if it would, then it was a matter for great satisfaction to the dental profession. It was an end Mr. Tomes had long desired to obtain, and one for which he had spent no little time, but in vain.

Mr. G. CUNNINGHAM said that Mr. Cotterell's remarks seemed to imply that the electric cautery was exclusively of use to the surgeon. Mr. Cunningham found it of great service in some dental operations. It was, in his opinion, the least painful method of removing overgrowths of gum.

The PRESIDENT then called upon Mr. Caush for his paper on exostosis. (See page 529)

DISCUSSION.

The PRESIDENT said that Mr. Caush's paper had opened a considerable field for observations to be made, and he (the President) therefore felt fully justified in prolonging the meeting. The points in the paper which seemed to be of special interest were those in which Mr. Caush alluded to the presence of vascular channels through the dentine and cementum. Another point was the enlargement of the interior of the pulp canals, and the occurrence therein of giant cells and excavations that had been made. Mr. Caush's explanation of the sensitiveness of dentine near its periphery was most ingenious and interesting. It was, however, a matter of considerable difficulty to discuss a purely scientific paper of that kind, as it were, offhand. They were very much indebted to Mr. Caush for it and for the interesting lantern exhibitions; their thanks were also due to Mr. Curtis for the successful way in which he had manipulated the slides.

Mr. F. J. BENNETT said the members would doubtless be inclined to agree with the President as to the difficulty of discussing a paper so full of detail. Mr. Bennett would have been glad to have seen the specimens under a higher power so as to obviate an appeal to the imagination for the lacunæ and giant cells. He also had some difficulty in understanding how the giant cells could have been seen after they had been rubbed down with a corundum wheel. Again, in many cases canals might be seen passing between the surface of the root and the pulp cavity, and he had considered it to be in this way that the pulp chamber became absorbed, by the passage of osteoclasts down these canals to the cavity. Mr. Bennett had a specimen in which the entire interior had been largely excavated by means of cells leading from the surface of the teeth to the cavity along such canals. One point which struck him as being novel was the statement that there was no appearance of secondary dentine in those cases in which exostosis was present. Mr. Bennett could not recollect having met with secondary dentine in cases of exostosis, but its absence was a point which they should try and verify. He thought it would have been interesting if Mr. Caush could have furnished them with some details as to the cases from which the specimens had been selected, they would have been glad to know why it was that the pulp canals were enlarged and a little clinical history would have helped them.

Mr. W. HERN wished to ask Mr. Caush if he had examined the loose bodies which are often found in the pulp chamber. There was also a point in connection with those canals which were shown in some of Mr. Caush's excellent specimens, in which the blood canals ran from the dentine to the cementum. It seemed possible that these canals might explain the periostitis which occurred sometimes when devitalizing teeth. There was a periostitis which occurred when the pulp was half dead, that is to say when the crown portions were dead and the other parts were not : due apparently to vaso-motor disturbances of the vessels, and not to direct irritation by the arsenious acid on the periosteum. This kind of periostitis passes off with the death of the pulp, and can often be cut short by an additional application of the devitalizing agent to a pulp which still retains some of its sensation. The presence of vascular canals connecting the pulp and periosteum tends to confirm this view.

The PRESIDENT said there were one or two specimens which Mr. Caush had alluded to to be seen under the microscope, perhaps he would show these at the close of the meeting. There was one point which the President did not quite follow as the paper was being read, viz., as to the sensitiveness of the dentine close under the enamel, perhaps Mr. Caush would explain that more fully in his reply.

Mr. CAUSH desired to thank the Society for the kindly way in which the paper had been criticised. With regard to Mr. F. J. Bennett's remarks, he would say at once that none of the slides exhibited had been touched by the corundum wheel. Mr. Caush thought he had made it sufficiently clear in his paper that the specimens had all been rubbed down by the method of Mr. Charters White, and that but for the information which Mr. White had given them as to his method his (Mr. Caush's) paper would probably never have been written. With regard to the giant cells which Mr. Bennett could not understand, Mr. Caush could only say that the slides were on the table to be seen under the microscope, which might help Mr. Bennett—possibly Mr. Caush had given wrong names to appearances. Then, again with regard to the canals passing from the dentine to the pulp, if Mr. Bennett would remember there were some of the slides projected on the screen in which the canals only passed half-way through the dentine, so that in these cases it would have been impossible for the canals to have passed from the dentine to the pulp, it must have been

outwards. With reference to Mr. Hern's question, Mr. Caush had only examined a few very loose bodies—they were rather difficult to get at : in those he had examined he had found very little structure whatever, and as a rule a few tubuli scattered through the structure. With regard to the remarks of the President, perhaps Mr. Caush did not make himself quite clear ; what he desired to prove was that the tubuli were hollow, and that sensation goes direct through them from the pulp, and in that case nerve fibres in the tubuli form a rude means of giving sensation. In conclusion, he had only again to thank the Society for the kind manner in which the paper had been received.

MANCHESTER ODONTOLOGICAL SOCIETY.

THE usual monthly meeting of the above Society was held on Tuesday, May 5th, at the Grand Hotel. Mr. H. CAMPION presiding.

CASUAL COMMUNICATIONS.

Mr. LINNELL exhibited a model of the mouth of a patient which showed on the left side of the lower jaw a cluster of five well-formed bicuspidis and on the right side a supernumerary tooth in the region of the bicuspidis.

Mr. SIMMS exhibited a plaster model showing reproduction of papillary patches of inflamed mucous membrane on the hard and soft palates, and stated that this resulted from tobacco smoking, and was especially prominent in this case because of the smallness of the mouth, and the consequent projection forward of the soft palate. He was unable to say whether the inflammatory condition was due to Nicotine or other constituent of tobacco smoke, or was due to the heat of the smoke itself, but he had observed the same appearances frequently in the mouths of inveterate smokers.

The PRESIDENT suggested that the quality of the tobacco might have something to do with the inflamed condition ; several similar cases which had come under his observation had apparently been caused by smoking bad tobacco.

Mr. DUNKERLEY said he had often observed that the mouths of smokers were in a foetid condition, and on enquiry he had found the tobacco was of an inferior kind and had been smoked through a clay pipe.

Mr. COLLETT also said that he had observed the same condition described by Mr. Simms, and had always found it was due to excessive smoking.

Mr. W. A. HOOTON said that at the previous meeting he had been asked to submit the fossil jaw shown by Mr. Renshaw to an expert to ascertain to what animal the bone belonged. He had suggested at the last meeting that it belonged to the Ox species, and that opinion had been borne out by Professor Boyd Dawkins of Owens College, who pronounced it to be the jaw of the Celtic Ox, the *Bos longifrons*.

Mr. COLLETT drew attention to the fact that ordinary aerated soda-water had been found very useful by him in cases where the saliva was "ropy" owing to excessive mucous secretion. He suggested that patients should keep a syphon handy and occasionally wash the mouth out with a wine glassful, as a possible deterring agent against caries. Medical men had told him that soda-water dissolved the mucus in bad throat cases as well as anything, and he thought that dentists and their patients might possibly derive some benefit from its use.

Mr. COLLETT also exhibited two molars which had become united through exostosis and thought that they were remarkable as being joined simply by cementum. Geminated teeth are common enough and are generally congenital, but in the specimen shown the union was evidently a pathological process. According to the patient from whom the specimen was extracted, a similar condition had been met with on the right side of the mouth, the particular specimen shown consisting of 1st and 2nd left upper molars.

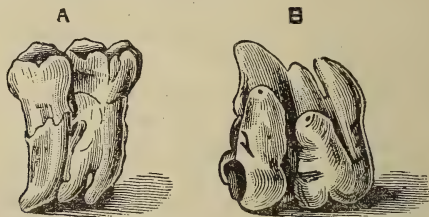


Fig. A gives a view of the labial surface ; and
Fig. B a view of the palatine surface.

DISCUSSION.

The PRESIDENT said that the subject introduced by Mr. Skipp was a most important one, for they all knew the difficulties experienced in destroying pulps. For many years he had

used the arsenical preparation known under the name of 'Azotine,' and he had every reason to be satisfied with it. As a covering for the dressing he used Fletcher's "Artificial Dentine," applying it in a very liquid form to obviate the danger of pressure on the pulp; if the cavity was well dried previously, the filling so adhered to its walls as to prevent the possibility of any of the arsenic leaking out. He should like to ask Mr. Skipp in what condition he found the pulp in the case he spoke of when the arsenic had been left in the cavity for six months.

[Mr. Skipp.—There was a complete absence of odour.]

Mr. COLLETT said he agreed with Mr. Skipp that in these cases when pain supervened, it was owing to undue pressure. He also advocated the use of a mastic dressing in preference to gutta-percha to seal the cavity.

Mr. DUNKERLEY, referring to the difficulty sometimes met with in destroying the vitality of the nerve tissue, suggested that it was often due to partial calcification of the pulp. Secondary depositions were even found deep down in the root, and prevented the action of the arsenic.

Mr. PETER HEADRIDGE said that in all cases where pain was present, he inserted a carbolic dressing to allay the inflammation before he applied the arsenic; he thought the application of arsenic to an already inflamed and painful pulp would tend to increase the pain. He used a mixture of Arsenic and Morphine which he believed was better than Arsenic alone. In cases where the pulp retained a portion of its vitality after the first dressing it was his practice to work the arsenic by means of a fine probe towards the apex of the root. He was unable to agree with the use of "Fletcher's Dentine" or other similar preparations in such cases, believing that their use involved pressure on the pulp. In his own practice he placed dry cotton wool over the Arsenical dressing, covering the whole with plaster of Paris.

Mr. SIMMS thought plaster of Paris of too unstable a nature to be of practical use in these cases. That, at any rate, had been his own experience. As a caustic to gum tissue, protruding into a cavity of decay, he advocated the use of Dr. Richardson's Preparation, "Ethylate of Sodium," allowing a pledget of cotton wool soaked in the liquid and covered with a mastic dressing, to remain in the cavity a day or two. He was unable to agree with Mr. Skipp's statement, as he understood it, that the application of arsenic to an exposed pulp was invariably painful. He

thought the death of the pulp could often be brought about without any pain, especially by avoiding pressure.

Mr. WOLFENDEN and Mr. JONES said that they protected the pulp from pressure by placing over the dressing a small cap made from a visiting card, covering this with cotton wool steeped in Carbolized Resin and Fossiline.

Mr. WHITTAKER said that in approximal cavities and to avoid leakage of the arsenic, he pressed a small piece of softened gutta percha, dipped in chloroform to the cervical edge of the tooth, and then applied the arsenic, covering that in turn with a second piece of gutta percha.

Mr. W. HEADRIDGE said he has used arsenic alone, but he had not found it so useful as a mixture of arsenic and morphine. He would prefer to use plaster of Paris to gutta percha to cover the arsenic.

The PRESIDENT, summing up the discussion, remarked that when a patient came to him complaining of pain from an exposed pulp, he often found that the application of arsenic cured it rather than increased it. He thought no time could be stated as being sufficient for the arsenic to destroy the pulp. It was necessary to allow the arsenic to remain until the pulp was devitalized, or at any rate until the pulp had worked loose from the walls of the cavity, when it could be easily extracted. In regard to arsenic causing pain he had found almost invariably that in cases of recent exposure great pain was caused, but when the pulp has been long exposed less pain was felt.

Mr. SKIPP having replied to the discussion, the President expressed the thanks of the Society to him for his paper, and the proceedings then terminated.

Dental News.

QUEEN'S COLLEGE, BIRMINGHAM.—Dental Department. The Council of Queen's College at their last meeting resolved to award medals as well as Certificates in the three special Dental Subjects, viz.,—Dental Surgery, Dental Anatomy and Physiology, Dental Mechanics, also to offer for competition an Annual Entrance Scholarship value £15, commencing with next October.

All information thereon may be obtained by applying to John Humphrey, Hon. Sec., Dental Board.

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DENTAL MODIFICATION FOR FUNCTION IN MAMMALIA.*

By REGINALD E. BASCOMBE.

Mr. President and Gentlemen :—I know full well that most of the papers read before this Society are written relative to the practical or surgical side of dental science ; it was with this fact in mind that I resolved the subject of my Paper should if possible be chosen from the Anatomical or Physiological side of dentistry.

Although the title would infer that I intend dealing at length with the subject of “ Modification of the *whole* dental Armature,” yet to do so adequately and thoroughly, would be by far too exhaustive in every way to be contained within the limits of a Paper, therefore I shall resolve what I have to say into three primary divisions, and those relating to *Mammalia* alone.

A. A few general remarks on the modifications in the dentitions, as a whole, among mammals.

B. Instances of Rudimentary teeth ; some remarks on the causes of their presence, and state of development.

C. Teeth as Sexual weapons.

If my remarks lack those elements of originality which make papers, uninteresting in themselves, of interest to those that read them, and if to a great extent I may be quoting words and ideas which are not my own, I am sure the reason will be intelligible to all ; for it would seem presumptuous for one with so little experience as I to take upon myself the responsibility of propagating theories on such a subject.

My paper is that of a *Student* to a Students’ Society, and if my fellow students are able to benefit by any word or sentence which may fall from my lips, then I shall feel that I am amply rewarded.

* Read before the Students’ Society National Dental Hospital, London

Throughout the various divisions of the animal kingdom great diversity exists in the dental formula as well as in other organs, yet through all can be traced as it were connecting links which show that there is in all a something common ; in fact the idea is given that from a *common parent form*, a so to speak *model organisation*, each modification was derived in successive generations by a process of evolution, that is to say from "*Fewer ancestral forms*" modifications have been arrived at, in number, shape, and size of the dental organs, these being so regulated as best to fit the creature to a special habit of life, and enable it to perform the functions—

A. For maintenance of life.

B. Of reproduction.

C. Of adaptation to surroundings.

Connecting links between existing and extinct species are to be found, in fact it has been said that extinct species can all be classed either *in* or *among* existing groups.

Thus modern true Ungulates or hoofed animals are now divided into Perissodactyles and Artiodactyles, "odd" and "even toed" groups, but the *Macrauchenia* of South America connects these two to a certain extent.

Again *Hipparion* (extinct) is intermediate between the existing horse and older ungulate forms.

A third instance is found in the extinct *Zenaglon* and *Squalodon*, which have been placed by some authorities in an order by themselves, by Professor Huxley and others they are grouped with the Cetacea, or Whale family. Animals belonging to two perfectly distinct groups may have striking resemblances between single organs or parts, which have been adapted for the performance of the same functions, this applies to the dental as to other organs. To illustrate this we have the *Thylacine* (a marsupial) which mimics the dentition of the dog, which as you know is one of the Carnivora ; but the resemblance is confined to the general appearance, the prominence of the canines and the cutting shape of the molars, for the teeth differ much in relation to size and structure, the permanent dentition likewise is preceded by a widely different milk dentition, that of the Marsupials being exceedingly poor, and that of the Carnivora correspondingly good. Another instance of modification for direct use in "procurement of food and sustenance of life," is seen in the Wombat (marsupial), *Cheiromys* (Lemur), and the ordinary Rodents.

At the same time that the Wombat and *Cheiromys* mimic

the rodents, there are points in their dentitions in which they show their ancestral affinities retained by the power of *Inheritance*. But these resemblances which they bear to a totally different class have been brought about by *Natural selection* with one point in view,—to render the creature better able to support life and obtain food.

The operating of a grand *process of evolution* has been the machinery by which every change, in number, size, shape and structure, of the teeth has been effected throughout the whole of the animal kingdom.

I will now recapitulate in as terse language as possible the modifications for function in the dentitions of the different class of mammals.

A. Fish-eating individuals are characterised by sharp conical, interlocking teeth, a good example of which is found in the dolphin.

B. The general characters of *carnivora*, are the smallness of the incisors relatively to the size of the canines, the former always numbering six in each jaw, and standing in a straight line across the front of the mouth, the outermost being large and pointed like a canine. The upper incisors are frequently trilobed.

The canines are large, powerful, firmly implanted and widely separated from each other. The upper canine is separated from the incisors by an interval or “diastema” into which the lower is received.

The premolars and molars in the *carnivora* differ much, in the typical flesh-eaters the molar series is reduced in number and shape, consisting merely of blades which play on one another. But in this order considerable gradation is to be found, the bears for instance being mixed feeders, others being purely vegetarian, these are characterized by an increase in the molar series numerically, in some almost reaching the full mammalian number, the blades also have become replaced by tubercles and broad crowns, while the typical *carnivora* require no broad grinding surface for mastication, using the blade-like teeth to slice the food.

The jaws are short and of great strength, the zygomatic arch is large, giving an expansive surface to the masseter muscle. The condyles of the jaws are transverse and play in transverse sockets allowing of little rotary movement.

C. *Insectivora* have incisors like the blades of forceps for picking up insects.

Tomes says "Insectivora are ancient and generalised mammals, and may be supposed not to have diverged far from the parent forms of other mammals. The molars are multicuspid, and present in most a W pattern, which is brought about by an elevation of the cingulum into three or four external cusps and one internally; in others the number is decreased by the junction of two or more into a ridge, in others again the number is yet further reduced.

D. Omnivorous individuals have squarish and chisel-like incisors (to slice the food).

The molars are broad tipped with rounded tubercles.

E. *Herbivora* have strong incisors (the Ruminants have none in the upper jaw, their place being taken by a thickening of the gum, probably to assist the tearing of the grass &c., in grazing.

The molars have broad grinding surfaces, and are celebrated for an involution of tissues and an elevation of the cingulum so arranged that the surface is always rough forming a good pounding surface for triturating the food. (A thick covering of cement over the crown being a special character in many).

It is not my intention here to enter minutely into the changes which have occurred by a *process of evolution* in any particular group, as such an undertaking could not be worked out adequately in a treatise such as this, but in passing to the second part of my paper I will just mention one modification which has been, and still is being wrought in the teeth of civilised races. Since man in his incipient civilisation thought fit to invent the *fork* with which to supplant his fingers in their function of conveying food to the mouth, and the *knife* to cut up the refractive materials, instead of allowing that process to devolve on his incisors and canines, certain of the teeth finding that a great part of their function had been withdrawn the food being placed between them in more or less a state of mastication, or at any rate laceration, have become, and perhaps are becoming, to a certain extent modified, and more or less rudimentary by the law of *natural selection*. The third molar (so called wisdom tooth) bears this out well, and it has been proved by comparison of European skulls of to-day with those of years ago, or even with those of modern uncivilised races, that the third molars of the former are smaller and seldom reach to the typical state of development.

Finally, through all we see the working of probably the most perfect system which the world has ever seen; how perfectly

adapted are the teeth of each group to the uses to which they are put. We have but to take one example to see how absolutely necessary such a system is; suppose by some irregularity in this theory of evolution, one of the Insectivora were to develop eight lower teeth similar in pattern to those of a ruminant, at the same time acquiring the corresponding thickened gum above, in place of its forcep-shaped incisors, then unless it could adapt itself at once to a herbivorous diet death from starvation would be the certain result.

B. Proceeding to the second part of my subject I will begin by giving a list of the mammals which possess rudimentary teeth, and will then endeavour to give some feasible explanations regarding their condition and presence.

Instances of Rudimentary *milk* teeth are found in

- (1) Seals.
- (2) Marsupials.
- (3) Proboscidae (the elephant tribe) a rudimentary milk molar is present in front of the rest.
- (4) Horse. (canines).

In the Seals the milk teeth are stunted functionless, and are absorbed before birth. Also in the Shrews the milk teeth have almost died out.

In *marsupials* the milk teeth, as in the *seals* are probably dying out, the dentition consisting of one milk molar on either of the jaws, four in all.

The Wombat and Dasyurus have none. In the Thylacine (or Tasmanian wolf) this single molar is small and absorbed before the eruption of any other teeth.

Kangaroos retain it later, and in the Kangaroo Rat it ranges some time with the permanent teeth.

In explanation of the apparent dying out of the milk teeth in these two groups, we see that the milk teeth of the *Elephant Seal* are still more rudimentary than those of the common Seal, and its permanent teeth are all simple in character, its dentition being much similar to the Homodont-monophyodont cetacean the Grampus; from this and parallel cases it has been agreed by Messrs. Flower and Oldfield Thomas that the permanent set of diphyodonts corresponds to the single set of the monophyodonts, and that the milk dentition, when existing, has been added on to the permanent set. Mr. Tomes suggests that the normal mammalian dentition is diphyodont, that is to say, possessing two

sets of teeth, the first set being replaced by one of a more permanent character, and that the monophydonts (those in which no succession takes place) have lost their milk dentition, and other orders, such as the seals, have retained them in a rudimentary condition. At any rate, one reason for the dentition's rudimentary state in these groups is, that it is not required by the species.

Schmidt says that the milk teeth can be traced back to the shortening of the *facial region*, which gave no room for the full number of tooth germs to lie side by side, the result was they came to lie one above the other, the teeth nearest the surface being developed first.

Mr. Tomes in reply says according to this state of things, the milk teeth are placed disadvantageously, being encroached upon by the permanent successors, therefore the seals and marsupials may once have possessed, but now are losing their milk teeth.

"Instances of Rudimentary *Permanent* teeth" are found in :—

1. Sirenia (a) Young *Mannatee*. incisors buried in the horny pad in the front of the mouth.

(b) *Dugong*, had eight to ten curved distorted teeth in the front of the mouth covered by horny plates. It had also one milk predecessor to the incisive tusks, it has been doubted whether it is not rather a rudimentary incisor.

2. Cetacea. (a). *Hyperodons-Bidens* (a ziphoid) has twelve or thirteen rudimentary teeth in both jaws.

(b) *Balænoptera-Rostrata* had 41 heterodont tooth germs, (simple in front, bifid at sides, and trifid at back).

3. *Proboscidea*. An *Elephant* from the Sewalik Hills had two rudimentary premolars.

4. The P.M. is rudimentary in the Pig, Horse, and Hippopotamus, and is soon lost.

5. Canine in the mare.

6. In female *Narwhals* the upper tusks remain enclosed in the bone of the jaw.

7. The upper canines in Deer with few exceptions, such as the Muntjac, *Hapdropotes-Inermis*, etc.

8. In the Walrus, small rudimentary teeth are sometimes met with behind the molars.

I shall now explain as far as I am able, why these teeth are present, and the cause of their state of development.

Many organs other than teeth, are met with in a rudimentary form, to illustrate this we have the *mammæ* in the male.

First of all then, these rudimentary organs, whatever they may be are useless and functionless.

If it could be proved that every part of the organisation tends rather towards diminution than augmentation, then at once the problem would be solved. But there are many objections to this ; for instance, if such were the case there would be no reason to find one organ out of a number structurally the same, and performing the same function, as the teeth, degenerating to a far greater extent than the rest.

In some works on Natural History, rudimentary organs, are said to have been formed "for the sake of symmetry," in order to complete the scheme of nature."

That this is incorrect and inconsistent is proved by the boaconstrictor having rudiments of hind limbs, why then have they not been retained by other snakes which do not possess a vestige of the same. (*Prof. Weissman*).

It is well known that *continued* disuse of an organ leads to its reduction in size (instances are found occurring in everyday life to corroborate this), and also that the result is "inherited," here then is an explanation, disuse would first lead by slow steps to the more and more complete reduction of a part, until at last it became rudimentary.

Again, an organ useful under certain circumstances may become, under others, injurious, in this case *natural selection* will have aided in reducing it until it became harmless and rudimentary.

So then the presence of teeth in a rudimentary condition may be said to depend on the fact of their no longer being of use to the creature ; and have been reduced by the operating of the law of *natural selection*, yet by the power of *inheritance* are still retained upon the scene. In other words, on the theory of "descent with modification" the origin of rudimentary organs is made plain.

But now from the foregoing statements another difficulty arises ; what agent is it which further reduces an organ already in a stunted and suppressed condition until the merest vestige remains.

Mr. Darwin in his "Origin of Species by means of Natural Selection." Vol. II. suggests as a possible answer the law of *economy of growth* " by which materials forming any part

or organ of no use to its possessor are saved as far as possible, but this will almost necessarily be confined to the earlier stages of reduction, for it would be ridiculous to think that the minute papillæ in the male flower, composed solely of connective tissue could be further reduced for the sake of economy.

An organ serving for two purposes may become rudimentary for one and remain efficient for the other; for example, the swim-bladder in certain fishes is rudimentary for its proper function of buoyancy, but has become converted into a nascent lung.

It is often difficult to distinguish between rudimentary organs, and those in a *nascent* state, but instances of the latter are rare for they commonly (as would have been expected) will have been succeeded in the next generation by the same organ in a more perfect state of development.

Another important fact with regard to such rudimentary organs, as the teeth in the upper jaw of whales and ruminants is this, that they can often be detected in the embryo, but afterwards disappear. It is, I believe, a universal rule that a rudimentary part is of greater size relatively to the adjoining parts in the embryo than in the adult. Hence rudimentary organs in an adult are often said to have retained their "embryonic condition."

Moreover, at whatever period of life an organ has become reduced, by becoming useless and functionless (and this will generally be after maturity, when the animal has to seek its own food and fight its own battles) the law of *inheritance* will tend to reproduce the organ in its reduced state at corresponding ages, but will seldom effect it in the embryo. Hence we can readily understand the greater size of rudimentary organs in the embryo relatively to adjoining parts and their lesser relative size in the adult.

Hence, on the principle of successive slight variations being inherited at corresponding periods, we can understand the resemblance in the embryo of parts which are homologous, and which when matured become widely different in structure and function.

Finally, considering that when organs are reduced in size whether by disuse or natural selection it will generally be at that time of life when the animal has to provide for its own wants, and considering the strong power of inheritance, the occurrence of rudimentary teeth might even have been anticipated. They have been compared, by a great authority, with

the letters in a word, still retained in the spelling but useless in the pronunciation, but which serve as a clue to its derivation.

C. Teeth as Sexual weapons.

When males are provided with *weapons* which are either absent or rudimentary in the female, there can be no doubt that these serve as sexual weapons and were acquired through "*sexual selection*" being transmitted to the males alone. Instances of such with regard to the teeth are found in :—

1. Horse (canine).
2. Many male apes have canines larger than the females.
3. The left canine of the male Narwhal is developed into the well known spirally twisted tusk, the right is unerupted.
4. The male Dugong has tusk-like incisors ; in the females of both Dugong and Narwhal both are rudimentary.
5. Male musk deer has no horns but immense canines, the female has none.
6. Swinhoe's water deer is another example of hornless deer with canine teeth.
7. The great development of tusks in the male elephant.
8. Of the canines in the male Susbahirussa, where they curve up so abruptly in the upper jaw as to pierce the lips and then turn backwards so that the points almost pierce the eyes.
9. Also in the wild Boar.

There are many other instances bearing on the fact, but these I have mentioned as being fairly demonstrative of the case in hand.

It is easy to comprehend that males furnished with more formidable weapons than their fellows, will have far greater chance of victory in battles with other males, so enabling them to monopolise the females and *transmit* to their offspring their own peculiarities. This is the explanation then of "*transmission of variations by means of sexual selection.*" Thus it can be understood how the development of teeth, which do the duty of "*sexual weapons*" will be increased in successive years by a *process of evolution* until such enormities are arrived at as the canines of the Susbahirussa.

Speaking of horned animals it is probable that horns even when equally developed in both sexes, were primarily acquired by the male in order to conquer other males, and have been transmitted to the females.

Perhaps as well as sexual selection, "*correlation of growth*" may have something to do with these abnormally developed teeth, to bear this out we find that in deer when the horns are developed, the canine teeth are absent or suppressed, and again after castration, stags do not renew their horns, or boars their tusks, thus proving that there is a relation between the growth of parts adapted for the same purpose, so that when one is destroyed the other is likewise affected, also that two distinct kinds of weapons adapted for fighting other males are *not* developed in the same animal.

The male reindeer, however, is an exception, as after castration he does renew his horns, this perhaps seems to indicate that possession of horns is not a "sexual character," the females also developing them, but they are formed at an age long before the sexes differ *constitutionally*, so it is natural that castration should not affect their growth in this case.

The male Munt-jac (deer) is an exception to stags not developing both horns and canines.

But though these teeth and tusks which have been developed in excess are used as sexual weapons, they also serve for other purposes; thus the elephant uses his tusks in attacking the tiger, also in scoring the trunks of trees to extract the farinaceous material within the core.

The canine of the horse is rudimentary in the milk dentition as might be expected for reasons I have already stated, their development in the adult male being a sexual character.

Whenever the male possesses canines now inefficient, the females having rudimentary teeth, or none at all, it may be concluded that the male ancestors had efficient canines, which have been partially transmitted to the females.

The reduction of such teeth probably has been brought about as the natural result of a change in the manner of fighting caused by the development of new "*sexual weapons*."

Evidence in favour of teeth serving as sexual weapons finds strong support in the fact that in many males such teeth are erupted at a much later period than in the females, thus proving their function, in that not being needed till sexual maturity, they do not take their place in the dental formula until that period. Examples are found in Gorillas and certain Apes, where the canine in the male is not cut till after the 3rd. molar.

Finally, with females, the males possessing teeth greatly

developed as sexual weapons, the development of such (teeth) would be to them a great waste of vital energy, taking into consideration that they would be useless and without function, hence they would have tended to have become suppressed and rudimentary, or even obsolete, in the female, through natural selection, and perhaps also by the law of economy of growth.

I thank you, gentlemen, one and all for the courteous and kind indulgence you have given to the hearing of my paper. I will no longer trespass upon your valuable time, but if any word or sentence which has fallen from my lips may have formed within your minds elements fit for discussion, then I shall feel that my duty is accomplished, and that my reward is great.

THE CHOICE OF FILLING MATERIALS.*

By F. L. TANNER.

MR. PRESIDENT & GENTLEMEN,—The ideal properties of a filling material are generally stated to be, 1. Hardness; 2. Indestructibility; 3. Adaptability; 4. Suitable colour, 5. Non-conductivity; 6. Ease of introduction. It should further (7) not be injurious either locally or constitutionally, and (8) it should be but slightly injured during the operation of filling by the entrance of moisture and (9) if introduced soft it should undergo no change of form or bulk in hardening. Among the crowd of substances which have been, and still are used, none answer all the desired requirements.

The first material used to any great extent was lead foil, similar to that found round tea-chests, and was very favourably spoken of; but owing to the superior claims of gold foil which came into general use about 1760, it rapidly fell into disuse. About 1830 tin-foil came into general use, and has continued more or less in favour up to the present time. Early in the present century, a fusible metal called D'Arcet's Mineral Cement was largely used, particularly in France; it became plastic at 212° F., and was placed into the cavity in molten condition. Wood's Metal, brought out later, melted

* Paper Read before the Dental Students Society of Manchester.

at 140° F., small pieces were placed in the cavity, and there melted by the application of heated instruments. But neither of those alloys were used for very long. Since then, almost every possible material likely and unlikely has been tried with more or less success. During all this time, however, gold has held its own, as the nearest approach to a perfect stopping ; though during recent years, with the introduction of amalgam and other plastic materials, a great change has come over the dental profession generally with regard to the materials employed.

It is not so many years back that a former edition of "Harris' Principles and Practice of Dental Surgery," which is still the text-book chiefly used on the other side of the Atlantic, and is also largely used in this country as a guide in operative dentistry announced that "gold in the opinion of the author is the only metal which should be employed for filling teeth," and that "amalgam is decidedly the most pernicious material that has ever been employed for filling teeth." To such an extent was this "gold, all gold, and nothing but gold" policy carried in those days, that the American Society of Dental Surgeons, expelled several members in consequence of their using amalgam as a filling material. As usual, the making into a sin that which was not a sin, provoked a reaction, which has reached its highest development in Dr. Foster Flagg's interesting work "Plastics and Plastic Fillings." English dentists certainly appear always to have treated the question of filling materials in a more eclectic spirit than their transatlantic brethren ; but even they until recent years, have written of amalgam as a makeshift, and of gutta-percha as only fit for temporary fillings. However, the tendency in this country at least, now seems to be in the opposite direction ; and probably many teeth are filled with cement or amalgam which would be better filled with gold, alone or in conjunction with some other material as tin, amalgam or cement.

In undertaking then, to fill a tooth, the intelligent operator will invariably ask himself now-a-days, not "How shall I best make a good gold filling?" but "With what material or materials shall I fill this cavity, so as to obtain the best all round results?" and probably in all, but very simple cavities, better results will be obtained by using a combination of materials, than by limiting ourselves to the use of any one material. Dr. Flagg says with respect to this question, "the

idea is ever tacitly accepted that a cavity of decay must be filled with one material, totally ignoring the palpably presented fact, that materials which possess certain tooth-saving attributes and are deficient in others, can be utilized in their proper place, while these again can be protected by other materials, which though deficient in the essentials possessed by the former, are, in a wonderful degree, possessed of those very essentials which in these have been found wanting." The principle advantages to be gained from the use of a combination of materials are increase of ability to arrest decay, and a large power of resistance to thermal changes. To these may be added preservation of colour and appearance, and economy in cost of material ; and also in some cases considerable diminution in the amount of time and labour required to make a perfect filling.

When a case for filling presents itself a choice has to be made of a number of filling materials, and certain considerations influence the decision. The principle ones are (1) Position of the cavity ; (2) Extent of decay ; (3) Structure of the tooth tissues ; (4) Sensitiveness of the dentine ; (5) Age of patient ; (6) Condition of the oral secretions and patient's general health ; (7) Time at the disposal of operator and patient ; and last, but not least, especially in the case of patients of limited means (8) The cost of material and the remuneration required for the time requisite for the more lengthy operations.

In order to be able to form a sound opinion as to which is the best material or materials to use for any particular case, I propose to consider somewhat briefly the properties of the substances at present in general use, and thus to obtain as near a correct idea as possible of their relative value in the various cases and under the different conditions which are met with.

Filling materials then may be, for convenience sake, classed under 4 heads. (1) Metals in their unalloyed state ; (2) Amalgams ; (3) Osteo-plastics ; (4) Various other materials.

1. *Metals in their unalloyed state.* These are employed either in the form of their sheets or in a finely precipitated condition, but much more commonly in the former form.

A. Gold Fillings are merely stoppings, or they are remedial agents, or they are both. Now while the zinc plastics are the most remedial or therapeutic in their action, gold is the typical stopping. It is, I suppose, placed at the head of

the list by us all, for no other material possesses so many of the desired properties in such a marked degree, and for teeth that are old enough and dense enough to stand it, and where other considerations do not render its use inadvisable, there is no other material to be compared to it.

Its advantages may be said to be, that it is hard enough to resist mastication, is fairly tough ; is practically unacted on by the oral secretions, it can be adapted to the walls of a cavity fairly well, is of fairly good colour if not too conspicuous, though far inferior in this respect to the osteo-plastics and gutta-percha ; it has no ill effects whatever, either local or constitutional, and lastly, it neither expands nor contracts. Its disadvantages, and some of them are serious, are that its colour for the front of the mouth is too glaring ; it is a good thermal conductor ; it is seriously affected by the presence of moisture during filling ; and lastly, the large amount of time required to build up a large filling, especially if done cohesively, and the difficulty of manipulating it in out-of-the-very cavities. However, there occur but few cases in which the insertion of a gold filling is impossible, thence, regarding the question merely from a theoretical point of view, it might be plausibly urged, that the instances are rare in which the use of any other material as a stopping intended to be permanent is justifiable ; and indeed probably numbers of teeth are lost or nearly so, especially on the other side of the Atlantic, by attempting to use it in unsuitable cases ; for instance, in difficult distal cavities in back teeth. The amount of healthy enamel and dentine which it is requisite to ruthlessly cut away, so as to "well open up the cavity," as it is facetiously called, is certainly in very many cases quite unjustifiable. By all means remove everything that is unreliable, but, unless for very strong reasons indeed, a large amount of perfectly sound tissue should not be sacrificed. In such cases a plastic filling, or combustion of gold and plastic, carefully introduced, after thorough excavation, will probably serve our patients' interests, and consequently our own, better than after sacrificing a large amount of sound tissue, inserting at considerable expenditure of time, and trial of both patients' and operator's patience, a gold filling, about which in many cases a certain amount of doubt must exist.

The situations in which gold is plainly indicated are first approximal and lingual cavities occurring in the incisors and canines, and mesial cavities in bicuspsids, in which situations

æsthetic considerations must largely weigh, and hence amalgam is unsuitable owing to its colour, and secondly small and medium sized cavities on the masticating surfaces of the first and second molars, and particularly in the lower jaw, as these are more conspicuous when the mouth is open. Small cavities too, on the approximal surface of both bicuspid and molars, if they are fairly accessible, and do not extend close to the gum, are best treated by inserting a gold filling; larger cavities in these situations are better filled with tin and gold combined to suit the particular case. The use of gold is contra-indicated in the cavities not readily accessible, as those extending a considerable distance down distal surfaces of bicuspid and molars, and where an element of doubt must nearly always exist. Also in large coronal cavities all gold fillings do not last so well as either tin and gold combined or amalgam, besides occupying considerable time in building up, if they are thoroughly consolidated. In front teeth where the walls are very soft and frail, and not likely to withstand the force required, or where the thinness of the labial wall would necessitate the removal of a considerable portion of it, a plastic filling is desirable. In all cases of very soft or chalky teeth, or where absolute dryness cannot be maintained, gold alone does not yield good results.

Gold fillings inserted during childhood nearly always fail, besides causing the little patients hours of needless suffering, to say nothing of the operator's patience. Hence, the material should not be employed till *after* the constitutional changes, which occur at puberty, or before the 16th or 17th year generally; for not only is the dentine not sufficiently dense till this age, but also during this trying period, the saliva becomes more acid, and decay is peculiarly liable to occur and recur. Moreover in young persons the teeth are often peculiarly sensitive. But age alone is not a safe criterion, the condition of the mouth, and the patient's general health must also be considered. If the teeth are still very sensitive, if the saliva is of a viscous ropy character, indicative of acidity, or if the patient has been growing so fast as to outrun his strength, or if pride of appearance has not yet created a feeling of interest in the preservation of the teeth, it is better to trust to plastic work a little longer. Patients of a highly nervous temperament, or those whose physical condition is such as to render them unable to safely endure protracted and painful operations, should have gold used only

in exceptional cases. In those whose teeth have, on the whole, stood fairly well, changes in the constitution may have a markedly injurious effect, and among these pregnancy is undoubtedly the most common, probably due to an alteration in the secretions. During such periods as these, generally nothing more than the temporary treatment should be tried, and gold had better be altogether avoided.

With regard to the form in which it is best to employ gold, it may be stated generally that foil makes a harder and denser filling than cylinders, and though on approximal surfaces where great hardness is not the first consideration, cylinders are equally good, besides being more convenient to use, still even here it is always advisable to finish off with a little foil. On masticating surfaces, however, hardness is very essential, and if cylinders are employed for the deeper part of the cavity, a good layer of well condensed foil should be placed on top. Sponge gold is now rarely used, for smaller pieces must be used, and then condensing force requires to be more carefully and thoroughly applied, otherwise a spongy filling results, consequently more time and labour are required to fill with it than with foil. Still it is sometimes useful to make a foundation, whereon to build cohesive foil, as it is easy to get it to lie dead against the walls of the cavity. It is also sometimes of use in starting shallow cavities, in which there is little hold, without the use of retaining pits.

Platinum is not now much used on account of its harshness, and the difficulty experienced in thoroughly adapting it to the irregular walls of some cavities; otherwise in colour it surpasses gold, while it equals it in regard to hardness and freedom from chemical action.

Tin, owing to its greater softness, may be manipulated in larger pieces than gold, with greater rapidity: for the same reason also it is comparatively easy to make a water-tight filling with it. It is also less spoilt by moisture during the process of filling. Still it is rarely used alone on account of its softness, though in one locality tin either alone or combined with gold is invaluable, viz:—where decay extends either down to or beneath the margin of the gums. This cervical edge is the vulnerable point in a filling, and if decay recurs in an approximal cavity which has been carefully filled, it will almost invariably make its appearance in this situation. We must therefore place at this part of a cavity some material which has decided action in arresting decay and at the same time

is fairly easy of introduction and is not spoilt by a small amount of moisture ; for to get absolute dryness at this point is often impossible, and this is probably partly the reason why a gold filling so frequently fails here even if carefully inserted. For this purpose four materials are employed, tin or tin and gold, copper amalgam, submarine amalgam, and gutta-percha, and all have this advantage. The latter cannot be relied upon as absolutely permanent, and hence should rarely be used with gold, while in some cases it is also very difficult to use owing to the presence of a slight amount of moisture ; the two amalgams are not altogether suitable for the front of the mouth, and will be considered later on ; but where either a gold or tin and gold fillings is to be inserted, tin has a decided advantage over the other three, except in cases where the decay extends so deeply beneath the gum, that it is difficult to manipulate properly, here probably one of the amalgams will be best.

Tin and gold combined. This combination forms one of the best filling materials we have at our command. Its chief advantages are its exceeding softness and adaptability, in consequence of which it is more easy to make a perfectly water-tight filling with it, than with gold alone ; the ease and rapidity with which it may be inserted—a filling can be done in the majority of cases with it in less than one-third the time required for an all gold filling ; the consolidation of the material subsequent to its insertion,—this is due to electro-chemical action, whereby the tin is dissolved and redeposited upon the surface of the gold, and hence we find the filling soon becomes much darker and changes first to a grey and finally to a nearly black colour, while it also becomes in course of time extremely hard. Dr. Storey, of America, says that the hardest filling he ever saw was a tin and gold one, which had been in 28 years and which almost turned the edge of his excavator in attempting to cut it. Tin and gold is also not perceptibly injured by moisture during filling ; indeed Dr. Miller says that he has done many fillings completely under saliva with perfect success. After the insertion of the filling a very slight expansion takes place, and thus the cavity is hermetically sealed ; even though the operation may have been somewhat defective, though of course the material must have been well condensed. In this respect it exhibits a striking contrast to amalgams. The combination further never discolours the teeth like amalgam ; and as it is a comparatively

poor conductor of heat it can be used much nearer the pulp than gold. The only serious objection to its use is the dark colour which it ultimately assumes ; while the fact that it cannot be cohesively also somewhat limits its use. Nevertheless, in certain cases it is better suited than any other material, what these are we will now briefly consider. Owing to its discolouration it cannot be used in a conspicuous places, but is eminently suited for cavities, the lingual surfaces of incisors and canines generally. If the front wall of enamel is thin anywhere a little gold should first be placed over it to prevent the dark material showing through. In extensive caries on the approximal surfaces of the front teeth, and yet where a gold filling is thought advisable, by first covering the cervical and palatal walls with the combination and the completing the filling with gold, a better result is obtained in considerably less time. Medium-sized and large cavities on the grinding surfaces of molars may be very satisfactorily filled with it. In these cases soft gold fillings do not yield good results, while cohesive ones occupy a very long time.

In teeth with enamel of a soft chalky nature, which shows but little resistance to decay, a water tight stopping is absolutely necessary. To obtain this with gold in such cases is almost impossible, much less with amalgam, hence secondary decay as a rule soon appears around the margin of the filling, but if filled with the combination, as a rule, good results can be relied upon.

In most cases where it is impossible to maintain complete dryness of the tooth, as where the cavity extends some way beneath the gum, or when the rubber dam cannot be used for some reason, as in the case of nervous or sensitive patients which object to its use ; it is much easier to use than gold. Teeth that are very sensitive can be thus filled without the use of retaining pits and with less shaping. In teeth too that are very susceptible to thermal changes, or where decay extends near to the pulp, it is far superior to gold. If the decay extends close to the pulp, and to remove the last trace of softened dentine would be unwise, the first few pellets immediately covering this part may be dipped in oil of cloves or carbolic acid, and thus a more complete and lasting sterilization of the carious tissue be achieved than by simply washing out the cavity.

In yet another class of cavities tin and gold is very desirable, viz:—in teeth that are clasped by gold bands or wires for the

retention of artificial dentures, and which it is not desirable to fill with gold. If such cavities are filled with amalgam, an electrical current is set up between the gold clasp and the amalgam stopping, and this is conducive on the one hand to electrical decomposition of the amalgam, and on the other it liberates mercury, and this in turn destroys the gold in the course of time.

In cavities where the filling would show, as on the masticating surface of lower molars and mesial surfaces of bicuspsids, &c., a capping of gold may be placed over the tin and gold, and thus all the advantages of a gold filling be obtained. Indeed in deep cavities on the grinding surfaces of molar teeth, it is simply waste of time and labour, as well as an absolutely unnecessary infliction upon the patient to fill the entire cavity with solid gold, when better results can be obtained by filling the greater portion of the cavity with the combination, and in half the time. To secure the two parts of the filling together, roughen the surface of the tin and gold portion, and then make one or two retaining pits either with a sharp wedge-shaped instrument or a bur, and fill these with cohesive gold, and from this foundation complete the filling. It is surprising how "kindly" the gold "takes to" the tin and gold, and how little anchorage is necessary to retain the gold cap.

Many other cases in which this combination of metals may be used with advantage will suggest themselves.

B. Amalgams. There is no subject connected with the practice of dentistry that has been the cause of so much controversy as the use of amalgams for filling teeth. Necrosis, salivation, and pyæmia have all been attributed to their use; still the almost universal consensus of opinion amongst dentists to-day is that no deleterious effects, either local or constitutional result from their use in the mouth, although such an authority upon surgical questions as Mr. Jonathan Hutchinson claims to have seen a number of cases in which they have.

There are two classes of amalgams in use, (1) Those in which the combination is a binary one, consisting of a solution of one metal in another, the latter being invariably mercury; while of the former three metals are or have been employed, viz:—palladium, copper, and silver. This class while they change their bulk and shape less in setting than the next one, possesses one great disadvantage,—they all undergo considerable discoloration. (2) The so-called "alloy amalgams," con-

sisting of an alloy of three or more metals of which tin and silver are invariably the most important ones ; these two are dissolved in mercury.

All the amalgams possess in a greater or less degree five serious drawbacks—they all discolour, those that are the best tooth preservers discolouring most ; in the higher grade alloy amalgams their defect is considerably diminished, though in some mouths the best amalgams will discolour. All amalgams, with the possible exception of palladium, contract in setting, and hence permit leakage ; and those which possess the best colour contract most. All too tend more or less to assume a spheroidal form in setting. Besides this they are all wanting in toughness and hardness, hence they wear away, and if a thin edge of amalgam is left, it is almost sure to break away. Lastly, most of the amalgams stain the tooth tissue, copper and silver being the worst offenders, while some of the higher grade amalgams only stain slightly. By exercising care in using, however, most of these defects can be considerably diminished. Thus by not using an excess of mercury discolouration is lessened : by tapping the filling in instead of burnishing, the amount of mercury throughout the filling is more equal, and consequently contraction and spheroiding are both lessened ; by leaving square and not bevelled edges, the tendency for thin edges to break away is obviated ; and lastly by varnishing the cavity or lining with oxychloride of zinc staining of the tissues and leakage are prevented. Notwithstanding these defects, amalgams possess several very marked advantages, viz :—The ease with which it can be packed into irregular and out-of-the-way cavities, and the short time in which large fillings can be done with it ; it also possesses tolerable hardness ; has considerable power to prevent further decay, and finally contour fillings can be done with it with the greatest ease. Regarded simply as a tooth-saver, amalgam is unquestionably superior to gold. With the same amount of care it will save more teeth than gold, not only with less expense to the patient but with less fatigue to both operator and patient. From an æsthetic point of view, however, it is inadmissible where it will show, and where much strength is required, it is inferior to gold. With few exceptions it should be employed for cavities in bicuspid and molars in all those cases in which one of the metallic fillings already considered are not advisable. In very soft, friable or chalky molar or bicuspid teeth, especially where the cavities are large or diffi-

cult of access, or the walls frail, amalgam is superior to gold. Most distal cavities in the back teeth, unless very small or easy of access ; and generally all cavities in these teeth where either the preparation of the cavity or insertion of the filling would be difficult, amalgam will probably yield the best results. In cavities high up on the necks of molars, approximal ones especially ; and in those cavities not unfrequently found on the buccal surface of the teeth, and where any kind of filling is difficult and unsatisfactory, amalgam is advisable. In wisdom teeth also, owing to their inherent softness and the difficulty of operating upon them, amalgam should generally be used. In nearly all cavities in the back teeth of young persons under 16 years of age or thereabouts, a temporary amalgam is better than gold, unless an osteoplastic or gutta-percha filling will last sufficiently long. Lastly, in nearly all those cases previously considered, and in which a gold filling was found to be inadvisable, amalgam is generally the only resort. In the front teeth amalgam is rarely admissable, though it may sometimes be used where the teeth are of a very dark colour, and in the case of men of the labouring class, Among the poorer class of patients amalgam fillings must always copperly take the place of gold ones.

Copper Amalgam is probably the one most commonly used in Europe. Speaking of it, Dr. Miller says "It is the only filling at present in use, which exerts a continual anti-ferment action upon the walls of the tooth, and its immediate surroundings. Not only that, but the very substance of the tooth containing such a filling itself becomes antiseptic. Secondary decay in such cases would be next to impossible, where anything like cleanliness was observed. I do not hesitate to say that if our only object is to check the destruction of tissues by caries, there is no material at present in use, with which this object may be so easily accomplished as a good copper amalgam."

Besides this, it both shrinks and changes its shape in setting less than any other form, with the exception of palladium and possibly silver alloy and amalgam. It may approach nearer to the pulp than any other metallic filling, except possibly tin. By slightly stimulating the pulp it encourages calcification, and even if the pulp should die, it does not so rapidly decompose. When unprotected by a higher grade amalgam, copper amalgam fillings gradually disappear by decomposition and gradual wasting away rather than by attrition. Although

in many cases it stains the tooth substance considerably, especially if of a soft nature, still this may be largely prevented. The best way to accomplish this is by lining the cavity ; but very fair results may generally be obtained by carefully washing the amalgam previous to using, in a little warm water, and then carefully drying ; also by having the cavity as dry as possible, and using the amalgam in that condition in which it contracts least. Dr. St. George Elliott has showed that while there is only very slight contraction if used of medium softness, if used very soft, we get more than six times as much contraction, while if used dry, the amount of contraction increases to about thirty times as much as if used of medium consistency. If then these precautions be taken, it will frequently be found that although the filling itself becomes jet black, it does not stain the tooth. In many cases of crown cavities in molars, a layer of some harder amalgam may with advantage be placed over the copper filling to prevent wearing away in mastication. In packing this layer care must be taken to obtain a good holdfast, for as the higher grade amalgam sets more rapidly than the copper, and also contracts more, there is very little union between the two. Care should also be taken to first get rid of all excess of mercury in the copper filling, otherwise it will gravitate through the superposed layer, and not only cause considerable discolouration, but also prevent it from attaining the necessary degree of hardness. One great drawback to the use of copper amalgam is the time it requires to set, and the consequent liability to displacement of the filling ; but this may be considerably lessened by heating the amalgam several times and allowing it to set ; by this means also the edge strength is considerably increased. The cases in which copper amalgam is particularly useful, are for filling temporary teeth, and as a temporary filling for permanent molars in young persons, for most back teeth of very soft structure, and for the cervical edge of all cavities extending to or beneath the gum when amalgam is to be used.

Here I would like to say a few words upon finishing off amalgam fillings at the margin of the gum. Too much care cannot be taken not to leave any rough or overlaying edges either of tooth or amalgam, otherwise irritation of the surrounding tissues may occur, and a thin acid exudation is poured out, or even if this does not occur, the rough edges favour the accumulation of particles of food at this point, by

the putrefaction of which acid is produced. To one or both of these causes I believe that many cases of failure in amalgam fillings at the cervical edge are due, this also is the probable cause of the wasting away of these fillings sometimes seen to have occurred very considerably at this point. In all cases of amalgam fillings, where the cavity extends to or beneath the gum, if the rubber dam is not used, it is advisable if possible first to pack a little cotton wool beneath the free edge of the gum, when this is removed after filling, any loose bits or overlying edges of amalgam are brought away with it, which if left would be liable to cause irritation.

Palladium amalgam is now almost entirely abandoned, as owing to the rapidity with which it sets, it can only be used in very simple cavities. It probably yields the nearest approach of any amalgam to a water-tight filling. Though it turns very black itself, it does not stain the tooth, and it is the most durable of all amalgams.

Silver alone as an amalgam is never used now.

Of the *Alloy Amalgam*, according to Dr. Foster Flagg, there are two principal grades, the *submarine* or back tooth, which is a *low grade alloy* possessing many of the properties of copper amalgam, but it is harder, tougher, and also yields better results in cavities from which it is impossible to exclude moisture, besides setting more quickly, and the *contour*, a *high grade alloy* which corresponds to the so-called gold amalgams. It possesses good edge-strength, fairly good colour, and is the hardest and strongest of all the amalgams, hence it should be used in those cases where an amalgam is desired, and yet it is impossible to keep it out of sight. A *medium grade* suitable for general use can be made by mixing submarine one part with contour two parts.

Gold and Amalgam. In gold and amalgam we have been considering two materials, each possessing desirable and undesirable qualities under certain conditions. If then we can combine the two in such a manner as to make use of the good qualities of both, and get rid of their imperfections, shall we not lessen the difficulty, and increase the possibility of saving teeth? If we were to examine two fillings, one of amalgam and the other of gold, which had been in for some years, we should very likely find the gold one defective near the gum, and the amalgam on the masticating surface. Hence in cavities on the approximal surface of back teeth, when the cavity extends up on to the masticating surface of the tooth,

a portion of the cavity near the gum, and perhaps some way up, may often with advantage be filled with amalgam, and then the filling completed with gold. In many cases too of large crown cavities in molars, where it is desirable to get as hard a surface for mastication as possible, and at the same time conceal the discolouration of an amalgam, this can readily be accomplished by filling the greater portion of the cavity with amalgam, and then finishing with gold.

In combining the two materials it is better to wait till the amalgam has set, and then varnish the surface before adding the gold to prevent the action of the mercury upon it. If this is not convenient, all possible mercury should be absorbed by the use of several layers of tin foil, otherwise a considerable amount of gold will disappear into the amalgam.

C. *Osteoplastics*. The advantages possessed by these cements are rapidity in setting; a considerable degree of hardness when set; the ease and rapidity with which they may be inserted without pressure; attachment to *dry* surfaces with considerable force, and hence they adhere firmly to the walls of a cavity and thus produce water-tight fillings, and also do away with the necessity for undercuts or retaining pits. Their colour too, though not equal to that of gutta-percha, and though wanting that lustre and semi-transparency peculiar to enamel is superior to that of the materials employed; and lastly, they are cheap. Their disadvantage, and that a most serious one, is that they are all more or less acted upon by weak acids and alkaline solutions, and hence cannot be relied upon as permanent fillings.

The *oxyphosphate of zinc* is the one most commonly employed, as being the most durable. In its place it is without doubt a most useful material, and there are many conditions under which it may be used with great advantage; as in shallow cavities with frail walls in the front teeth and generally in large approximal cavities in these teeth, in which the use of gold is contra-indicated from some of the many causes already considered.

Since it is acted upon by weak acids, it lasts best in those situations in which it is naturally made clear by the action of the tongue. In approximal cavities it does not last so well. Whenever the cavity extends either to or beneath the margin of the gum, the filling is sure to fail soon at this point, partly on account of the difficulty of getting the cavity quite dry here, owing to capillary action, and partly owing to the ten-

dency of particles of food to collect in this situation. Hence the cervical margin should always be protected by a layer of gutta-percha.

While in some mouths the preparation will last 5 or 6 years, in others it will not last as many months, hence some discretion is requisite in its use. Wherever there would be a tendency for food to collect in the neighbourhood of the filling, owing to the position of the teeth; in delicate persons where the saliva has a markedly acid reaction; and where the teeth are not kept scrupulously clean, a good preparation of gutta-percha will probably be more serviceable. In bicuspid and molars generally this cement should only be used as a temporary filling. Thorough dryness is the essential for success, hence the rubber dam should be employed in the majority of cases to procure the best results. A piece of rubber about 2 inches broad and three or four inches long is all that is necessary, and this can cause but little inconvenience to the patient: though the most perfect results would be obtained by entirely excluding the breath by employing a larger piece of rubber. It is indeed claimed for Fossiline that a small amount of moisture is not deleterious, but this is very questionable. Another class of cases in which this cement is useful is to partially fill a large crown cavity previous to the introduction of some metallic filling so as to protect the pulp from thermal changes any gold is employed to lessen time and expense.

In employing any filling, however, which contains free phosphoric acid, care must be taken not to let it approach too near to the pulp, if it does, death of the pulp will almost inevitably follow. If then only a thin layer of dentine remains covering the pulp, this should be varnished with copal ether varnish before inserting the filling. It is, however, claimed for Fossiline that it has not this objection to its use, and may even be used for capping exposed pulps; while Poulson's preparation, which certainly seems to yield the most permanent filling, is the most dangerous.

After inserting the filling, it will last longer if it is coated with some water-proof varnish, as copal, ether, or chlora-percha.

Oxychloride of Zinc. For general purposes this preparation is worthless and unreliable if used alone, except as a temporary filling; as being both hygroscopic and very readily acted upon by weak acids, it rapidly dissolves in the mouth. Where, however, it is protected from attrition and the action of saliva beneath a gold or amalgam filling, it lasts indefi-

nately long; and where it can be employed without setting up irritation of the pulp, it is the most comfortable of any filling in a tender tooth. Near to the gums it is far inferior to, but in crown cavities is more durable than the oxyphosphate. It is principally useful for lining cavities having frail walls to prevent discolouration by amalgam; and as a filling for the larger portion of very deep cavities when it is intended to fill externally with some metallic filling. As a temporary filling for obtruding sensitive dentine it is unequalled, though it should never be used anywhere near a pulp, as the free chloride of zinc would certainly result in its death. Dr. St. G. Elliot has shown that for securing pivots and artificial bridges it is much stronger than the oxyphosphates ordinarily employed for this purpose, besides possessing the great advantages of being more fluid and smoother to work and less sticky and also of setting more slowly. For the same reason it is also superior to oxyphosphate for filling root canals of dead teeth, possessing the additional advantage of being decidedly antiseptic.

Oxysulphate of Zinc is of even less value than the oxychloride as a permanent filling, but for capping exposed or nearly exposed pulps, especially if a little oil of cloves is mixed with it, it is the best material we possess. It is absolutely non-irritating both to sensitive dentine and the dental pulp, and also possesses therapeutic action as an astringent and antiphlogistic pulp preserver. Besides these advantages it can be employed very soft, and thus all pressure upon an exposed pulp be avoided, while at the same time absolute contact is obtained.

We now come to the last group of materials we have to consider, viz :—

IV. *Various other materials.* Of these the first must undoubtedly be accorded to the preparations of Gutta Percha. These adhere to the tooth, if perfectly dry, with some force, and hence are very suitable for shallow cavities, and those badly adapted for the retention of a filling. Owing to the slight amount of pressure required to insert it, weak labial walls can be retained, thus diminishing disfigurement in the front of the mouth. It is also one of the least likely of all substances to cause irritation to tender or sensitive teeth, it resists moderately well the acids and alkalines and also the temperature met with in the mouth. It is of excellent colour, very fairly resembling enamel, and lastly, it arrests the further

progress of caries with great persistency. Its great disadvantage however, and it is a serious one, is its insufficient hardness to resist mastication ; consequently it can only be employed on surfaces not directly exposed to attrition. Sometimes it appears to break up and become somewhat permeable to fluids in course of time. Nevertheless, it might probably be used with great advantage in many cases where an oxyphosphate is employed. For protecting the cervical margin in front teeth beneath an osteoplastic cement it is invaluable. One of the most troublesome classes of cavities to deal with are those occurring at the necks of teeth on the labial and buccal surfaces. The exposed dentine in these situations is often exceedingly sensitive, and in such cases it is not so much a question which is the best material to employ, as what is possible ; and here a hard preparation as Jacob's, which can be quickly inserted, often yields the best results. In these situations it will last 5 or 6 years, and may then be renewed, or frequently by this time the sensitiveness will so far have diminished as to allow of a more permanent filling. In cavities entirely protected from attrition it will sometimes last as long as 9 or 10 years.

The preparations of gutta percha have been graded according to the degree of heat required to soften them. The "low heat" variety softens between 140_o and 200° F. This should only be employed as a temporary filling ; the "medium grade" ranges from 200° to 210° F. This should only be employed in well sheltered situations, and the "high grade" is sufficiently plastic at from 216_o to 230°F. This is the only one with any claim to permanency. Two makes of it are most commonly employed, Jacob's and Hill's ; the former, an English preparation, is the best as regards both colour and durability, while the latter, an American compound, is more easily employed.

For filling approximal cavities in temporary teeth, red base-plate gutta-percha is the best, as not only is it extremely plastic, but it can also be worked in cavities from which it is impossible to exclude saliva. As a result of 238 experiments Dr. St. G. Elliott found that much greater leakage occurred if the material was packed in small pieces, and also that by varnishing the cavity first with copal ether varnish, all leakage could be prevented. The best way, according to him, to use it, is to select a piece about the size of the cavity, better slightly smaller than larger, as it is easier to add small pieces

than to remove surplus. Thoroughly soften the piece selected, and force it into the cavity, with a broad flat-ended plugger, by this means the material is forced into every part.

Combination of Oxyphosphate Cement with Amalgam. A method of combining cement and amalgam has been recently introduced and used to some extent, and the combination appears to possess some very considerable advantages over either material alone. Mix the amalgam in the usual manner, avoiding an excess of mercury, whereas the cement is mixed slightly thinner than usual, the two are then thoroughly incorporated by means of a stiff spatula. The amount of amalgam used is in bulk about one-third to one-half that of the cement. The filling is then inserted in the usual manner as a simple cement filling. It is claimed for it that it possesses adhesive properties equal or nearly equal to those of the oxyphosphate cement alone, while it is sufficiently hard to resist the action of mastication, and it is also not affected by the oral fluids to any great extent. With regard to its permanency it is impossible yet to speak definitely, but it is certainly well worth a trial.

Porcelain and Glass Inlays. We still have a class of cavities left, for which none of the materials so far considered are suitable, viz. :—those on the labial surfaces of front teeth. Gold is too conspicuous, tin and gold and amalgam quite inadmissible, oxyphosphate cement wears away and always looks as if the cavity had been filled with putty or something similar. Gutta-percha is one of the best materials for these cases, but is not sufficiently durable.

The most pleasing results can be obtained by the use of porcelain stoppers, those made out of old mineral teeth yield the best results, as thus any shades can be perfectly matched, and one nearly always has a number of old teeth on hand. For this purpose Ash's teeth are better than American, as they are of finer grain, and so admit of a much better polish. Unfortunately the use of these stoppers is limited to very simple cavities, besides which they are somewhat tedious to fit nicely.

Recently a method of filling these cavities with glass has been introduced, and is likely to come largely into use, as more irregular cavities can be thus filled in much less time, and if care is taken in matching the shade, very pleasing results are obtained. As to the durability time alone can speak.

Both the porcelain and glass inlays are secured in place with this oxysulphate cement.

I think I have now considered most of the materials usually employed as fully as time will permit, and in conclusion must thank you for the patience with which you have listened to the paper, which has grown to a length I did not originally intend it to.

MONKEY TALK.

“A STORY,” says the *Lancet*, “has reached us from the other side of the Atlantic, that phonography has been applied in order to unravel the secrets of monkey talk. Herein, if the story be true, lies a curious study for our psychological brethren, and a new experimental series of research. The experiments hitherto accomplished are elementary. but if sustained are of singular import. The phonograph is brought to bear on the monkey, which is led to utter sounds in its own *patois*, within the recording range of the merciless instrument. Its speech is in this manner taken down phonetically, and is, then recited, *totidem verbis*, to other monkeys that have not been present at the time when the recording instrument was at its duty. According to the character of the speech so the effect. If the observations be of a violent and threatening kind, the monkey listener is seized with sudden fear and flies from the place to seek safety or protection. If the conversation be of an appetising character, the listener responds by indicating his desire for food. These and sundry other manifestations of intelligent intercommunication by monkey linguistic skill are reported, and soon we are promised a complete literature of this next but one, and he a missing link, to man. Do not let our readers suppose that we are dealing too lightly with this subject. The question whether lower animals have a speaking language has occupied the attention of man for ages. The Koran describes King Solomon as listening to, learning, and interpreting the language of ants ; and it may be that language of different kinds passes between animals for expressing different wants and indications of danger. “Animals have a voice, men speak” has, up to this day, been the common belief. Now, for the first time, we have a means of discovering whether the voice of the animal is or is not a definite, however elementary, form of speech. Do monkeys, for instance, talk intelligibly ? All do not, we know, but do some ?”

British Journal of Dental Science.

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THE PREPARATION OF CAVITIES.

Any-one who, at this time of day, would write aught on the preparation of cavities in teeth for the reception of fillings, must surely present himself, cap in hand, with ample apologies for so doing. The subject is one which has been written on, and talked about *ad infinitum* during the last few years. Still it is just a question whether, in all this talk, the salient points have not rather been buried, than brought out into prominence. We propose, therefore, to state in a few words what we regard as the fundamental principles, which hold equally whatever kind of cavity we have to fill, whichever class of tooth to treat. It really matters little whether it is a labial cavity in an incisor tooth, or a distal one in a second molar, for the same rules should guide us in the one as in the other. Although there are many points to be observed, the cardinal ones seem to us to be included in the five following rules.

1. That the cavity shall be of such a shape as to retain the filling.
2. That the walls of the cavity be of sufficient strength to retain the filling.
3. That the cavity shall be so cut that it is possible to see and to get at every part of it.
4. That it shall have perfectly smooth, healthy edges.
5. That the pulp be not exposed.

Now, we believe, no one at the first reading would care to cavil at any of these statements, and yet how many men

seem to lose sight of them in their every day work. For instance, if the third rule were followed, accidental exposure of the pulp would rarely occur, yet who has not exposed pulps and who has not met with fillings inserted over such exposures? Again, if rules one and two were always observed, there must be fewer failures of fillings. As far as one can form an opinion from the observation of different men's work, it is rule three which is most honoured in the breach than in the observance. There is, and rightly so, a reluctance to cut away sound tooth substance in order to get at a small cavity ; but what is the result? There is no security that the cavity is properly prepared, no certainty that its edges are perfect, or that it is the right shape to retain the filling when inserted. Now if decay should start again from imperfections in our work much more tooth substance would be lost than it would possibly have been required to remove in the first instance. And what is the objection to cutting away a little tooth? The cavity being larger, it would take longer to fill, but is this not sufficiently balanced by the better work which is done? It is, of course, quite possible that we may be prevented from cutting more tooth substance away by considerations relative to the strength of that which remains, and it is in these cases that the use of plastics as linings are especially indicated, so that the cavities which remain after these have been inserted, may fulfil the conditions we have laid down.

It may, however, be necessary that we should explain that by seeing into a cavity we do not mean always direct vision, for this would ignore the existence of the mouth mirror. On the contrary, we would urge the use of this mirror on all occasions. With a little practice, it is as easy to fill a cavity being guided by a reflected image of the same, as it would be to fill it having a direct view of its every part, nay, in many instances, it is far more easy not only from a manipulative point of view, but, also by a saving of wear and tear of the operator. Too much importance cannot be attached to the need of attaining proficiency in the use of the mirror.

Granted, however, that by cutting away more of the tooth substance, the cavity walls are weakened, this does not involve a prohibition against so doing, if it be otherwise called for, but it does involve, so shaping the cavity that the filling material shall lap over and protect these weak walls, and it also involves the selection of a filling material of such edge-strength as to prevent these overlaps from being in danger of breaking away. In other words, if it be our desire to do our best for the saving of the tooth, we shall probably feel it our duty to advise the use of gold. Far too often is this protective use of the filling material lost sight of and yet it is of the very first importance. Over and over again, if this be carried out in a right manner portions of tooth, for instance the labial enamel of front teeth, can be retained and so the hideous vision of a golden smile be obviated. Some writers have laid it down as a rule that no enamel unsupported by dentine should be left standing. This is, no doubt, an excellent rule, but it is certainly one to which there are many exceptions. We would prefer to read the sentence thus. —“no enamel should be left standing which is unprotected” for we have made it sufficiently clear by our previous remarks, that it is possible to so build a filling round an otherwise weak portion of tooth as to protect it from all wear and tear, that it will last as long as the other parts of the tooth. It is of the very first importance that we should form a clear conception of the kind of cavity which is called for in each case, so that we may at once proceed to form this cavity, and not waste time by operating in a niggling manner, feeling our way, as it were, in a hesitating uncertain fashion.

WE regret that in the heading to the abstract on the life of Dr. Thomas W. Evans, of Paris, the word “late” should have crept in. Dr. Evans is alive and well, it was his brother Theodore who recently died, as indeed the text of the Abstract shows.

It is very important that we should bear in mind that on and after the 22nd. inst., the exemptions from examinations and productions of certificates, which have hitherto been allowed to those who had commenced their apprenticeship before the Act in 1878 was passed, will thereafter cease. This affects not only those who would claim to be entered on the register, but also those who would proceed to their professional examinations not having passed the preliminary, in future this will not be allowed. Seeing that thirteen years have elapsed since the Act was passed, we fancy most will agree that it was high time these exemptions ceased to be made, and will, therefore, welcome this step on the part of the General Medical Council.

It is interesting to notice in connection with the Hospital Sunday fund, which was collected on Sunday, June 7th, that the two churches at which the largest collections were taken in previous years are again at the head of the list, indeed the collections have increased. The two are St. Jude's, South Kensington, and St. Michael's, Chester Square. At the former £1,300 was collected as against £1,257 last year ; and at the latter £1,200 as against £1,106. Unfortunately this increase is not apparent in the collections at some of the other churches, but the returns not being as yet complete, it is impossible to say what the total amount will be.

Abstracts of British & Foreign Journals.

THE FRENCH DENTAL JOURNALS.

THE NEW LAW CONCERNING THE PRACTICE OF MEDICINE.

A special meeting of the "Association Générale des Dentistes de France," was convened on the 7th April, for the purpose of discussing the situation brought about by the new law as concerning dentists. *L'Odontologie* publishes a full report of the proceedings, from which we gather the following particulars. Over two hundred dentists were present at the meeting, including several students from the Dental Hospital of Paris. M. Lecaudey, the President, on taking the chair, called on M. Dubois, who with MM. Lecaudey and Godon had been appointed to look after the interests of the Profession during the passing of the Bill. M. Dubois explained that owing to the unexpected way in which the Bill was introduced, and the very brief discussion that was accorded to it, they had not been able to fulfil their wishes, or to bring their objections before the Chamber. He then went on to explain the objections to the Bill as it stood at present, and the means they should adopt to influence the Senate when the Bill came before that latter body. Clause 5 (as mentioned in the last number of our Journal) reads thus:—"The practice of dentistry is forbidden to everybody not holding a diploma of doctor of medicine, or surgeon, or a licence of dentist, granted by the French Government after examination by a Board of Higher State Medical Examination, and after a course of studies arranged by the Higher Council of Public Instruction."

M. Dubois considered that in this Clause the word "licence" should be altered to "diploma," as it originally stood, on the ground that the word "brevet" (*translated* "licence") applies to inventions and inventors, and may give rise to trouble and illegal use of the title. He asks, moreover, that the word surgeon-dentists be used instead of dentists, for the reason that inasmuch as all English, American, and German dentists are styled surgeon-dentists, it would place French dentists in an inferior position not to be able to use

the same title. He would also move for the addition of the following paragraph :—"Dentists over 30 years of age who have been in practice in France for more than five years, and those who possess the diploma of one of the two French Dental Schools at the time of the passing of the Act, shall be able to obtain the diploma of surgeon-dentist on submitting three proofs of examination."

Clause 6 reads thus :—"The right of practising dentistry is by a temporary proviso granted to every dentist proving by the production of his certificate, a year's practice at the date of the passing of this Act." This concession does not give in any case to dentists in the position indicated in the preceding paragraph, the right of practising anæsthesia."

M. Dubois would have the first part of this clause altered thus :—"The right of practising dentistry is by a temporary proviso granted to every dentist proving that he was in practice at the date of the passing of this Act." In the second part of the clause he would substitute the word general anæsthesia instead of anæsthesia alone, thus giving these dentists the right to employ local anæsthetics. M. Dubois then proceeded to show the position of those actually engaged in the profession. All those who have taken a licence before the 1st June, 1890, will be absolutely free from the retrospective effects of the Act. They will be able to practise their art in its entirety, only they must not employ general or local anæsthetics. Foreign dentists will be on the same footing as French dentists. As far as the present students are concerned, it seems that the only thing required of them is sufficient knowledge to pass the examinations ; it will not in the least matter whether they come from the two dental schools in Paris, from the Faculty of Medicine at Lille, from hospital clinics, or even as pupils of private dentists.

After M. Dubois had finished his report, a resolution was adopted, expressing the regret of the meeting, that the delegates of the Association had not been enabled to present to the Commission and the Chamber the wishes of the French dentists in regard to the rights of practice, and the teaching of their profession. A long discussion then arose as to whether the meeting should ask the Senate to throw the bill out altogether, maintaining the freedom of practice, and the *status quo*, or whether they should accept the bill as inevitable, and approach the Senate in a conciliatory attitude, in

the hopes of getting the more objectional features in the bill removed or amended. This last plan was at last determined on by a big majority, many voting for it, (M. Dubois among the number), although they were in favour of the freedom of practice, yet because they considered that it would be hopeless to expect the Senate to overthrow the bill altogether, and in striving for too much they might lose all. The various alterations that M. Dubois had suggested in his opening speech were then put to the vote, and severally accepted, and the delegates were instructed to lay these matters before the Senate.

M. LOUP contributes to *L'Odontologie* a paper on "THE TOLERANCE OF FOREIGN BODIES IN BONY TISSUES." He begins by describing the process of bone formation, and then passes on to what takes place when bone becomes inflamed. He quotes Troja on the subject of the secondary tissue which is thrown out around the seat of inflammation. "The membranes become more vascular, redder, less resistant, and thicker, they separate from the dead part, and secrete on their adherent surface a yellow or reddish liquid of syrupy consistence. This is a gelatino-albuminous lymph, which is hardened down, and soon becomes the seat of a bony deposit which starts at the same time at several distinct spots. From each of these spots start needle-like spicules of bone, few at first, but which soon increase in numbers, and the new bone spongy and reddish at first soon becomes solid." "If then," Mr. Loup goes on to say "we put in a bone a metallic root, what happens? The bone begins to inflame, and an osteitis is caused. Will it always be a sclerosing osteitis? No, but often a rarefying or absorbing osteitis." Therefore the operation must only be undertaken in carefully selected cases, where there are no contra-indications such as diabetes, scrofula, anæmia, hæmophilia, and other unfavorable diseases. He says: "For my part I consider the operation quite a feasible one, provided always that the bone is not exposed to the air too long, for on that depends success. Dr. Dall is content to make a hole in the bone to serve as a tube for the pivot pin of the apparatus. I am not altogether in favour of the operation thus performed. I think that the pin ought not to have the bone for its sheath as every movement of the piece will mean irritation and inflammation in the bone. We ought to limit ourselves to the insertion of a metallic tube closed at one end, taking the place of the extracted root.

THE TEETH OF INVERTEBRATE ANIMALS.

By Dr. ALTON H. THOMPSON.

THE paper called attention to the infinite resources of nature ; to the expedients to which she resorts as marvellous and endless in their variety ; to the fact that when new conditions are to be met her invention is never at a loss, and her capacity for change is boundless ; that environments change and corresponding alterations in organs arise to meet the new conditions presented ; that the life of a species depends upon this power to change, to conform to new environments—the law demanding adaptation or extinction.

In no set of organs—in animal life at least—is this infinite variety of resources, or the capacity for change, or the power of invention, so fully illustrated as in the teeth. Food selection has created a wonderful variety of forms of teeth which have arisen in response to changes in the food environment. Those species which could conform to gradual change survived and transmitted the required modifications in the dental apparatus. Those which could not change perished, or escaped to a more favourable food environment. From such causes many variations in the teeth of animals arose in the course of the geological ages, and, taking the living and the extinct species all together, the number and extent of these variations is beyond estimation. The variety presented in the different forms of teeth and masticating apparatus throughout the animal kingdom illustrates and exemplifies the fact that these organs are susceptible of great variation, and that the possibilities of change and the invention of nature are specially marked in them.

If vertebrated animals present great variations, and many extraordinary forms and interesting extremes in the structure of the dental armature, so also do the invertebrate animals, although these are not so well known. To the naturalist and the philosopher the latter are equally interesting, however, and serve to enlarge his views of the wonders and beauties of nature. To the dental student the teeth of invertebrates are interesting from the comparative stand-point, and serve to illustrate the remarkable possibilities of dental variation, and help to a better understanding of the principles of the mechanical evolution of the teeth of animals. In such studies

any knowledge is valuable which may contribute, even remotely, to a better understanding of the important organs which he is called upon to preserve, and thus better prepare him for his chosen work. The study of comparative anatomy is of great value for the side-lights it throws upon the teeth of man,—their origin, evolution, mechanical design, etc., and therefore he claims that the study of a branch, even as far removed from man as the invertebrates, is of sufficient value to warrant the presentation of a brief epitome of knowledge of this branch, by way of stirring up an interest in it as an incentive to further study and investigation.

Professor Huxley says ("Anatomy of Vertebrates"), "When invertebrated animals are provided with teeth or masticating organs, the latter are either hard productions of alimentary mucous membrane, or are modified limbs," as opposed to vertebrated animals, which also "usually possess hard productions of the alimentary mucous membrane in the form of teeth; but their jaws are ordinarily parts of the walls of the parietes of the head, and have nothing to do with the limbs." The vertebrate jaw is part of the endo-skeleton; the invertebrate jaw belongs to the exo-skeleton, as do the teeth of all classes of animals, as illustrated by their embryology.

Mr. W. H. Dall says ("American System of Dentistry"), "Almost every large group of organisms below the vertebrates, until we reach the molluscoida and lower radiated animals, exhibits in some of its members one form or another of prehensile or masticatory apparatus connected with the alimentary canal. None of these exhibit true homologies with vertebrate teeth, though some of them present remarkable similarity to the latter in external relation. They are divided into mandibular and dental appendages in the sense in which the latter may be said to exist in the invertebrates.

"Throughout the invertebrates the teeth are dermal structures, however much modified, and may consist of calcified connective tissue, of horny matter, or of chitine or an allied substance. The teeth and jaws of mollusks, the nippers, mandibles, and setæ of worms, are composed to a greater or less extent of chitinoid material."

Professor A. S. Packard says ("Standard Natural History"), "Hard bodies serving as teeth occur for the first time in the animal series, in the sea-urchins, where a definite series of calcareous dental processes or teeth, with solid supports and a complicated muscular apparatus serves for the comminution

of food. Among the worms the organs of mastication for the first time appear in the Rotatoria, where the food, such as infusoria, etc., is crushed and is partly comminuted by the well-marked horny and chitinous pieces attached to the mastax. In most other low worms the mouth is unarmed. In the leech there are three, usually in the annelids two, denticulated, serrate, chitinous flattened bodies situated in the extensible pharynx of these worms, and suited for seizing and cutting or crushing their prey.

"In the higher mollusks, such as the snails and others, besides one or more broad pharyngeal jaws, comparable with those in the worms, is the lingual ribbon, admirably adapted for sawing or slicing seaweeds or cutting or boring into hard shells, acting somewhat like a lapidary's wheel; this organ, however, is limited in its action, and in the cuttles, the jaws, which are like a parrot's beak, do the work of tearing and biting the animals serving for food.

"In the Crustaceans and insects we have an approach to true jaws, but here they work laterally, not vertically, as in the Vertebrates; the mandibles of the Articulates are modified feet, and the teeth on their edges are simply irregularities or sharp processes, adapting the mandibles for tearing and comminuting food. The numerous teeth lining the crop of Crustaceans and insects serve to further comminute the food, keeping the larger particles back till finely crushed."

Professor Bradley says ("Manual of Comparative Anatomy"), "The lowest forms possess no teeth, except some ciliate infusoria, which have an internal cylinder of parallel rods for the mastication of food. In the Rotifera, the denticles are in the shape of denticulated plates. The Echinodermata have five large teeth placed in the formidable apparatus called 'Aristotle's Lantern.' In the Annulosa, the leech is the only member that possesses teeth, the semi-lunar plates imbedded in the muscular walls of the mouth; but the remaining classes have only mandibles and maxillæ, which are very hard and chitinous. Among the Mollusca, the Gasteropods possess a strap-like organ, the odontophore, which is studded with teeth. Cephalopods possess horny jaws which move vertically. Some other classes have denticles besides.

In the Annelids (Dall, *op. cit.*), so-called teeth occur in many groups, but partake rather of the nature of jaws than teeth. This group comprises most of the worms, as well as

the leeches. Their bodies are divided into more or less well-defined regular segments, and in general the jaws are on the second or buccal segment, or on a proboscis which is itself on the outer edge of this segment, and may be protruded from the mouth to a considerable distance. They are chitinous, most commonly paired, lateral and opposite, of almost infinite variety of form, resembling in a general way the maxillæ of insects, and mimicking in miniature hooks, combs, saws, rasps, claws, etc.

"In the leeches, the mouth is provided with three lenticular jaws, with the projecting edges finely serrated, having a partly rotary motion about a point central to the three. The medicinal leech has two rows of serrations on each jaw.

"Among the Crustaceans, lobsters, shrimps, crabs, etc., the maxillary organs are but modifications of entire limbs translated from the locomotive series and set apart as special mouth organs. In the higher Crustaceans, the interior part of the stomach is provided with certain masticatory appendages or stomacholiths, often termed teeth, though more analogous to a sort of a calcareous gizzard. These consist of several calcareous pieces, moved by appropriate muscles, inserted in the membraneous wall of the stomach, armed with a smooth median plate and lateral molar-like organs, whose mimetic resemblance to the molar teeth of mammalia affords a beautiful illustration of the way, through the selective influence of similar functions, analogous structures may be built up in organs which have no homology whatever. Two smaller points—bicuspid in the lobster, tricuspid in the crab—complete the calcareous apparatus.

"Among the Echinoderms, the sea-urchin has a remarkable apparatus called 'Aristotle's Lantern,' which contains what may be fairly regarded as true teeth. It is very complicated in its arrangement, but in essentials consists of five hard, calcareous, wedge-shaped sockets or alveoli, each containing one porcelainous chisel-shaped tooth. The teeth are, like those of rodents, usually worn more on the inner than on the outer side, and therefore in wearing always preserve a sharp edge. The combination of the teeth and alveoli produces a pentagonal cone, the apex being formed by the coming together of the points of the teeth. In life this cone is concealed within the tissues, only the points of the teeth projecting."

Not many of the Mollusca are provided with teeth; the entire group of Acephala (the headless mollusks such as clams,

oysters, mussels, etc.) are entirely without head or dental apparatus, and not every one of the Cephalopoda (whelks, snails, periwinkles, etc.) are provided with teeth, but most of them have such organs. When they are found, they are arranged on the "odontophore, a chitinous band upon which the teeth are set, pointing upward and backward like the papillæ on a cat's tongue, and it grows out of the radular sac in the floor of the gullet. The floor of the sac is carried forward, with the radula upon it, over an arched, cartilaginous mass called the buccal cartilage and down to the front edge, immediately behind the mouth. This serves as an elastic pad which may press the denticulated surface of the radula against any object to be torn or cut. This is controlled by muscles which draw it backward and forward, or even protrude it, as can be seen in the common wood-snail," in which the buccal mass is pushed forward to seize and cut food. In the snail the number of these teeth is remarkable. Twelve thousand to forty thousand have been counted on the saw-like lingual ribbon. It can cut grass or leaves sharply off. As the teeth are worn off the ribbon, it is uncoiled and new teeth are thus brought into use. The upper part of the mouth is lined with a horny substance, against which the sharp-toothed tongue works with a rasp-like motion. The tough leaves of the lily may often be found cut by the snail's lingual ribbon.

"The teeth on the strap-like odontophore are varied and remarkable in shape and size, and are difficult to examine, as some of them are very minute and hard to dissect out and study. They are usually composed of a base, a shank or stem, and a cutting-edge, the latter simple or variously denticulated. The form of the cutting-edge is varied, the carnivorous forms usually having simpler and more claw-shaped teeth. When arranged in rows, as they are in many forms, the middle row is called the median or rachidian teeth, and the lateral rows, the lateral or pleural teeth. The latter are usually right and left. Sometimes there are teeth outside of the lateral rows, which are called the uncini, and are flat, plate-like, or slender, spiny teeth. They may be very numerous, as in the vegetable-feeding snails, or wholly absent in other forms."

There is much to be observed about the teeth of the snails and their allies, and the field offers a profitable opening for investigation. They are already divided into classes by an elaborate system of arrangement, but much remains to be done in describing varieties.

"The adult perfect teeth vary from nearly transparent to an amber-yellow or reddish brown, and sometimes the cutting-points are black. In any large whelk they are easily seen, and in a large cuttle-fish the radula may be an inch wide. On the other hand, in some small land-snails, where the whole shell is not larger than a pin-head, high powers are necessary to observe them. The highest type in the system of classification is called the Toxoglossate, or arrow-toothed, from their narrow, round form, often barbed, and sometimes hollow to inject poison, as in *Bela* or *Conus*.

"Next comes *Rachiglossa*, having only rachidian teeth, as in the common whelk. The teeth are usually slight and varied and prettily denticulated on the cutting-edge. The next is the *Toenioglossa*, bent-toothed, including the greater part of the fresh-water snails. The *Ptenoglossa*, feather-toothed, are a small group, of which the *sealaria* is a member. The *Rhiphidoglossa*, needle-toothed, comprise a large number of sea-snails, and a few operculated land-snails. The last is *Docoglossa*, chevron-toothed, and includes the limpets."

Some snails present a pavement-like form and arrangement of teeth, which are often of a very pretty pattern, or again a mere hardened mass.

The object of the paper was to give briefly the outlines of a study of the teeth of invertebrates, merely to indicate the extent of the subject, and to suggest the interest and attractiveness there is in its pursuit to the naturalist; and in addition that the study of invertebrate odontology has a positive value to the comparative dental anatomist, from a philosophical stand-point. As a leaf from the great book of nature, it unfolds many of her beauties and wonders. The subject is also pregnant with suggestions to the dental student who follows it out into all its branches. So in this branch there are varieties of form and adaptation to purposes which are not paralleled in the vertebrates. The study of their forms and fitness to perform particular duties is full of interest and surprises, in the fertility of design which nature exhibits. Then the analogies presented are very interesting, as in the case of the cuspidate teeth of the stoma-choliths of the Crustacea, which resemble vertebrate grinding-teeth, and show that similarity of function often develops similarity of form, even in dissimilar parts.

Of homologies with vertebrate teeth, there are few, as the jaws of the articulates work horizontally and those of verte-

brates vertically. In the few instances of invertebrates which have vertical jaws, those parts are armed with beaks and the teeth are situated farther back on the odontophore. The teeth of the sea-urchin have true sockets and alveoli, but their arrangement, support, and motion are very different from those of the vertebrates : so that taken altogether the class presents few homologies with vertebrates, or even resemblances to them, and thus affords a variety of illustration that the latter does not supply.

Cosmos.

“MR.” OR “DR.”

WE publish the following comments on the relation of the dental to the medical profession from the pen of a prominent and level-headed dentist. “I want to enter a protest against this Uriah Heep sort of humility in regard to the lack of culture among the dentists. I believe they will compare favourably with any profession on earth in general culture, socially, morally, intellectually. Someone said that a dentist could not talk anything but shop when he was out in society. When I accidentally get into a *crowd* which imagines itself society and they want me to look at their new store teeth I *quit*. I draw the line at that. I might give the young mothers a few points on teething if they crowd me pretty closely. But no one ever heard me announce myself as a dentist or undertake to amuse the company by describing my method of taking tartar off of some old duffer’s old snags. Snyder says he feels humiliated when he is called doctor and then has to acknowledge that he is *only* a dentist, and it is owing to the *assimilation* and general stupidity of the Fathers of dentistry that prompted them to call themselves Doctors—when they were *ONLY* dentists, and that *is* what we are, and why not say so. The title is like the powdered wig of the English barrister ; it does not deceive anybody. I think the English plan is much more dignified—just notice this Mr. L. C. Duval, *Dentist*. In that way I might be mistaken for a gentleman but *never* for a doctor, and if my calling card only bore the legend Mr. L. C. Duval (rather than Dr. L. C. Duval) I might escape many embarrassing questions as to the general health of my neighbourhood, and then if I had sense enough

to keep quiet I might be able to pass an evening in the society of gentlemen composing some of the higher professions. But seriously, I believe if we gave up the idea of being the tail to the medical kite and stand on our own dignity that we would certainly retain our own respect and I am satisfied that the field is so broad, and the character of the gentlemen of such a high order as a class, that we could safely take rank with the professions as a distinct 'Learned Profession.' "

Dental Review.

Reports of Societies.

STUDENTS' SOCIETY, NATIONAL DENTAL HOSPITAL, LONDON.

THE last ordinary meeting of this Society was held on Friday, April 8th, at 8 o'clock.

Mr. Burberry Rowe, the Secretary to the Society, being unavoidably absent through indisposition, the minutes of the previous meeting could not be read.

Mr. W. Robinson Humby in the absence of Mr. Pedley kindly consented to take the chair.

The following gentlemen were present as visitors, and received a hearty welcome from the chairman, Messrs. Pedler, Watson, and Stanley Read.

Messrs. Beverley and Myers were elected members of the Society.

Mr. Humby, on rising to ask the gentlemen who had any casual communications to bring forward, to present them to the meeting, remarked that it had been decided in council that Mr. Gaddes' paper should not be read, as Messrs. Pedley, Spokes, Greatham, and Rowe, were unavoidably absent, and owing to the absence of the latter certain diagrams illustrating the paper could not be produced.

CASUAL COMMUNICATIONS.

Mr. Humby shewed three cases.

1. A second superior lateral incisor with symmetrical curvatures in a distal direction.

2. Case of a first left upper molar where absorption had obliterated the palatine root, in a male patient aged 18.

3. An articulator made of Delta metal, the joint so made that a good firm fit is permanent.

An interesting discussion then took place, in which Messrs. Humby, Woolf, Cutts, Clarke, and Nicholls took part.

Mr. Humby then called upon Mr. Reginald Bascombe to read his paper on "Dental Modifications for Function in Mammalia."

The paper gave rise to a somewhat short, but interesting discussion in which Messrs. Humby, Woolf, Cutts, and Stanley Read joined.

Mr. Humby thanked Mr. R. Bascombe for his instructive paper on behalf of the Society, it was certainly the best he had heard read before the Society since he had been associated with it. He felt sure all present appreciated the great care and trouble which he had taken in writing his paper. It showed that his knowledge of the subject of "Comparative Dental Anatomy," was very thorough (all the more creditable in that Mr. Bascombe was but just in his second year), this was well evidenced by the way in which he had held his own in replying to the "points of discussion" which had been raised on his paper. It was with the view of hearing such papers from the students that he had attended assiduously the Society's meetings for so long. He felt sure that the paper must prove of benefit to every student who had heard it read.

The meeting was then adjourned till the second Friday in October, when a paper will be read by Mr. MacFarlane.

Mr. Bascombe's Paper was illustrated by pencil sketches.

STUDENTS' SOCIETY, VICTORIA DENTAL HOSPITAL, MANCHESTER.

Annual General Meeting held May 26th, 1891. G. G. CAMPION, ESQ., in the chair.

The minutes of last meeting were duly read and confirmed.

CASUAL COMMUNICATIONS.

The Curator, Mr. J. C. STOKES, showed the following cases which had been sent for the Society's museum by Mr. W. BIRKETT:—

1. Model showing peculiar supernumerary teeth.
2. Model showing misplaced canine.
3. Vulcanite plate repaired by jeweller.

Mr. J. D. LINGFORD showed:—

1. Model with two supernumerary teeth.
2. Well-marked erosion in incisor tooth.

Mr. F. V. WALKER remarked on a case where two central incisors had been extracted from a child three weeks old.

Mr. G. G. CAMPION in commenting upon this, quoted a case from the *Lancet*, in which a child had been born with four temporary teeth *in situ*.

Mr. F. L. TANNER said that in making copper amalgam, it was advisable to shake the deposit of copper from the iron plate instead of scraping it off, by this means no impurities from the iron were obtained.

Mr. D. HEADRIDGE suggested the use of *decarbonised iron for precipitating* the copper.

The Secretary, Mr. J. C. LINGFORD, then read the Annual Report of the Council, giving a brief resumé of the meetings of the session, and alluding to the hearty way in which the discussions had been participated in, and also to the excellence of the Casual Communications. He drew the attention of the members to the fact that satisfactory arrangements had been made for the publication of the Society's Transactions, and ended by wishing the Society every success in the future.

The Treasurer, Mr. HEADRIDGE, then read his report. He showed a balance of over £18 to the credit of the Society and pointed out that the chief expenditure of the year had been in books for the Library.

The Librarian & Curator reported that the Library had been increased by 10 vols., and the number of issues had been 134.

On the motion of the President, the reports were received and adopted as read.

The following officers were then elected:—

President—W. Simms, Esq.

Vice-Presidents—G. G. Campion, Esq.; D. Headridge, Esq.; W. A. Hooton, Esq.; P. A. Sinnell, Esq.

Hon. Secretaries—J. C. Lingford, (re-elected); G. Kershaw.

Treasurer—J. C. Stokoe.

Librarian—F. L. Tanner.

Council—Messrs. Bostock, Butterwork, Coogan, Tanner and Mr. J. C. Stokoe then moved a vote of thanks to Mr. Campion, for the able way in which he had filled the post of President. Mr. Campion in reply, said "it had always been a pleasure to him to preside at the meetings."

Mr. F. L. Tanner moved a vote of thanks to Messrs. Headridge, Silson & Stokoe, for the very interested way in which they had occupied their several posts. Mr. D. Headridge & Mr. Stokoe having briefly replied, the meeting was brought to a conclusion.

Dental News.

AT THE ROYAL ACADEMY OF MEDICINE, DUBLIN, a discussion on hypnotism was opened by Dr. F. R. Cruise, who very candidly confessed that a year ago he was quite undecided whether the usual statements of the chief French observers of hypnotism "were either astounding facts or most audacious falsehoods." A visit to Nancy and Paris, and a short study of the *cliniques* of Liébeault, Bernheim, Voisin, Charcot and others have convinced him "that hypnotism is a reality, and a great means towards cure, one which can never be crushed by ignorant and baseless criticism"; and "I believe," he continues, "that it is our duty, and our imperative duty, to do it justice, and rescue it from the hands of charlatans." He had been much impressed in Paris by seeing M. Voisin hypnotise an insane dipsomaniac girl whom, "by repeated hypnotism and suggestion M. Voisin cured not only of her mania, but also of her evil propensity"; and since his return from France, Dr. J. J. Murphy had been equally successful on a case of dipsomania under his care. Dr. G. C. Kingsbury followed with a clear speech explaining the methods and uses of hypnotism as practised at Nancy, some of which he had corroborated in England, and pleading that a fair trial should be given to the treatment.

APPOINTMENTS.

Ernest Parsons, L.D.S. Eng., appointed House Surgeon at the Dental Hospital of London.

Mr. J. Trude Fripp, L.D.S., Ed. & L., has been appointed Hon. Dental Surgeon to the Willesden Cottage Hospital.

ARE ARTIFICIAL TEETH "NECESSARY"?

Wm. Wade, dentist, Rhodes Street, for whom Mr. C. T. Rhodes appeared, claimed £2 11s. from John Scott, mechanic, Ellenroyd Terrace, Haley Hill, Halifax. Defendant was represented by Mr. E. Booth.

Plaintiff's case was that in June, 1889, defendant's wife was supplied with a set of artificial teeth—22 teeth there were, to be precise—for £4 8s., being at the rate of 4s. per tooth. Mrs. Scott had paid several instalments, first £1, and then several smaller sums; and one payment of 3s. was made by the husband. Difficulty in the hearing of the case was occasioned by the plaintiff not having brought his book into court. He admitted, however, that the account in the book would probably stand in the name of Mrs. Scott.

Mr. Rhodes submitted that this would not matter, seeing His Honour had previously held that a perambulator and a sewing machine were "necessaries" within the meaning of the law, and that the husband was liable to pay for them, even though he was unaware that they had been bought by his wife and not paid for, surely teeth were necessary. Robert Brearley, who at one time was assistant to the plaintiff, proved receiving from the defendant 3s. towards payment of the account.

Mr. Booth, in defence, commented on the unwisdom of dentists supplying working men's wives with luxuries to this extent, on trust. The defendant's wife had since died, and defendant had no means of ascertaining whether the amount now claimed was correct or not. What he knew was that he gave his wife ample to live upon, and when she got the teeth in question he gave her money to make up the sum they were to cost, and he had no notion that they were not paid for until a youth called about the matter.

His Honour said the real point to decide was, "Are the teeth necessary?"

Mr. Rhodes and Mr. Booth immediately held—one that they were, and the other that they were not.

His Honour held that this kind of what he called indiscriminate trusting of people was very unsatisfactory, and he ultimately non-suited plaintiff.

Mr. Rhodes; Well, your Honour, I never hope to win a case if I cannot win this.

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NOTES ON SOME MORPHOLOGICAL DENTAL IRREGULARITIES IN SOME OF THE SKULLS IN THE MUSEUM OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.*

By F. H. BALKWILL, L.D.S.E.

MR. PRESIDENT AND GENTLEMEN,—Some years ago, when interested in the development of irregularities in the cusps of modern English teeth, I wished to compare these with those of less civilised races. Through the courtesy of Professor Flower, I was allowed to examine the collection in the Museum of the Royal College of Surgeons in London, of which at that time he was Conservator.

I took notes of the teeth of about 400 crania, and hoped at some future time to enlarge these observations, which, however, I have never done. I wish, therefore, to place these notes on record as some of them may prove interesting, and at any rate are then at the service of future investigators.

The skulls were on shelves in cabinets, and apparently had been frequently re-arranged, as the numbers on the skulls were by no means consecutive, but the numbers on each particular skull do not seem to be altered, as during the summer of 1890, wishing to take models of two, I easily found them again, although a large collection had been added since I previously examined them; I should think, therefore, that any skull might be referred to by the numbers here given. On examining each batch of skulls, I noted anything observed with the number of skull, and then, before closing the cabinet, counted the number of skulls examined with such description, if any, as was labelled on the shelf.

* Read before the Odontological Society of Great Britain.

The following is a transcript of the notes :—

First lot of Skulls examined—24.

1,542.—Old Roman. Sulcus in upper lateral.

327.—St. Michael's Church, St. Albans. Two supernumeraries between laterals.

302.—From Tumulus, Cemetery, Berkshire. Extra cusp to upper molar.

Second lot of Skulls examined—52.

1,301.—Boschisman girl. Wisdoms not through, teeth crowded, extraordinary development of second lower bicuspid on both sides, teeth approaching in size a badly formed molar, all the teeth very clubbed.

A model of the lower jaw accompanies the paper with photograph; these do not, however, give a good idea of the teeth, as from their crowded position the model was a good deal dragged.

154.—African Negro, Bahia, Brazil. Left supernumerary opposite wisdom.

1,234.—Amazon, Dahomey. Africa. Slight sign of extra cusp on second and third right molars only. (Note probably upper.)

1,228.—Dahomey. Supernumerary molar.

1,650.—Eboe, Old Calabar. Upper wisdoms absent; second bicuspid smaller than first.

1,363.—Negro. Lower left canine and lateral—apocryphal.

1,624.—Debeara. Apocryphal left central.

35.—Apocryphal, lower bicuspid.

36.—Ditto, right upper canine.

31.—Ditto, all over.

84.—Apocryphal.

52.—Ditto.

125.—Ditto, left upper bicuspid.

1,290.—Left wisdom slight extra cusp.

1,291.—Apocryphal.

1,292.—Right upper first bicuspid crowded in.

1,284.—Upper first molar slight extra cusp anterior (lingual?) aspect.

Third lot of crania—15.

1,302.—Only left wisdom (upper?) second molar same side decayed, teeth crowded; second lower molars decayed.

Africa.

1,264.—Right and left upper first bicuspid decayed on both sides. Three roots, or nearly so, on one side more than the other.

Fourth lot of crania—48.

292.—Eboe, Guinea. Anterior extra cusp, as in 1,284, on both first upper molars.

Fifth lot of crania—48.

Melanesia.

1,079.—M. Fan, first upper molars, extra cusps as in 292.

1,626.—Debeara. Cluster of supernumerary teeth in region of left bicuspid; alveolus for third bicuspid on right side.

1,245.—Extraordinary lower second bicuspid width of molar.

3,380.—Slight mark of extra cusp, upper molars.

1,224.—Ditto, ditto.

1,216.—Teeth crowded, sulcus in upper laterals.

Sixth lot of crania—22.

Papua.

82.—Extra cusp on first molar.

Seventh lot of crania—47.

New Caledonia.

1,159.—Right upper first molar, extra cusp.

Australia.

1,062.—Upper wisdoms dwindling.

Eighth lot of crania—25.

America.

Comparatively feeble.

Ninth lot of crania—37.

Eskimo.

I have no note taken of these 37 Eskimo skulls, but speaking from memory the arches of the jaws were full round and uncrowded; the shape of the cranium, on the other hand, was long and narrow, an observation contrary to my expectation. The suggestion occurred whether if the Eskimo are in the habit, as related by some travellers, of chewing the seals' skins in dressing them to render them soft, this practice may not account for their fully arched jaws.

Tenth lot of crania—34.

Owyhee.

803.—Left upper wisdom, extra cusp small.

Maori.

769.—Supernumerary between upper centrals.

766.—Extra cusp both first molars (upper?).

749 B.—Skull of Gilbert Islander : large masticating teeth; feeble upper incisors, which are decayed ; three roots in right upper pre-molar (first or second?) ; left bicuspid alveolus, showing division as if for two external roots ; lower left second bicuspid, signs of division in external roots ; lower right first and second bicuspid, the same strongly.

Eleventh lot of crania—47.

Indo Malay Archipelago.

284.—Nay Kay. Three roots right first lower molar.

1,376.—Signs of slight divisions in outer bicuspid roots in first and second upper right side, first upper left side, first lower right side, first lower left side.

Twelfth lot of crania—8.

Asia.

Thirteenth lot of crania—26.

Asia.

The following are the points which seemed worthy of noting :—

In the first it was evident that many of the skulls belonged to owners who met violent deaths, which had often spoiled the dental armature. Interested parties had supplied the deficiencies thus caused, to make up appearances before parting with the skulls to the museums. Those skulls found in this state have been marked *Apocryphal*. I had supposed that the extra lingual cusp of the upper molar often observed in English patients would not have appeared in savage tribes; in this I was mistaken, as I found ten crania having extra lingual cusps on the superior molars out of the four hundred and thirty-three examined, but this cusp was situated rather anteriorly to the position observed in English patients.

Two skulls, No. 749 B and No. 1,376, had extra roots or indications of them in five bicuspid, in each case showing a Simian approximation.

Two skulls, No. 1,301 and No. 1,245, have peculiarly formed and large second lower bicuspid, as shown by models and photographs.

In practice I have occasionally met second lower bicuspsids with peculiarly flattened crowns.

Mr. Charles Tomes once asked me if I had noticed this flattening in first lower bicuspsids, which has led me to hope that these notes may be either useful or interesting.

THE ARTIFICIAL PRODUCTION OF DENTAL CARIES.

BY HENRY SEWILL, M.R.C.S., L.D.S.

It was my first intention to have merely given a brief description of the experiment by which Mr. Pound and I have produced dental caries out of the mouth, but at the invitation of officers of the Society I have extended my short remarks into a more lengthy communication. This will perhaps give more opportunity for discussion. Caries, although a well-worn subject, must after all be supremely interesting to the Odontological Society; and, although there may be no room for difference of opinion on main points, there are still a considerable number of topics well worth talking about.

The members are aware that the artificial production of dental caries is not a new feat. It has been already achieved by Dr. Miller, of Berlin, and through the kindness of Dr. Miller, who lent a selection of specimens, I was able to verify the fact that the microscopical appearances were virtually identical with those of natural caries. These slides were also examined by Mr. Arthur Underwood and Mr. Pound, and this fact was reported by me to the Society some two years ago.

After the investigations of Messrs. Milles and Underwood, of which the results were published in 1881, it became a matter of certainty that caries might be artificially produced. It had been demonstrated long before that the disintegration of enamel and dentine was mainly brought about by the action of acids, and it was also proved that the acids were in the main the products of fermentation of organic *debris* lodged

* Read before the Odontological Society.

upon or about the teeth. But in those days fermentation was looked upon as a purely chemical process, and the fact that proliferation of micro-organisms was essential to it was not recognised. Hence not only arose failure to produce caries by artificial means, but inability existed to interpret and fully account for several of the peculiar appearances presented by the tissues under microscopical examination. Messrs. Underwood and Milles were able to clearly show that these appearances were due to the presence and action of micro-organisms, and that the presence and the action of organisms were essential to the production and progress of caries.

Mr. Underwood commenced a series of experiments in producing caries artificially, but owing to the pressure of other work abandoned them before he had more than partially carried them out. As the members are aware, Dr. Miller—who, following Messrs. Underwood and Milles, has done an enormous amount of work in minutely tracing out all the phenomena of caries, and in studying the morphology of the organisms concerned—fully succeeded. The success of the experiment, of course, depended upon whether conditions sufficiently like those existing within could be created out of the mouth, so that teeth submitted to the influences would undergo those destructive changes which constitute the process termed dental caries. It was next found that with the exception of *leptothrix*, which will not flourish away from its proper habitat, all the organisms present in caries could be cultivated either together or isolated out of the mouth. These discoveries rendered more certain the possibility of artificially producing caries.

A little over a year ago Mr. Pound and I commenced experimentation. It was found after trying various mixtures of organic substances, such as occur in the mouth, that the best for the purpose was simply bread mixed with saliva. The proportion does not matter, but one part bread to eight saliva answers well. It is not necessary to describe failures with other substances, but some which are significant may be mentioned. Meat with saliva remained alkaline, and if a small quantity of acid were added became again rapidly alkaline. Albumen, whether as white of egg or other forms, acted in the same way. Saliva and starch produced little acid, which was soon exhausted.

About an ounce of the mixture suffices for several teeth. The teeth were immersed in the mixture in glass-stoppered

bottles and kept at a temperature of about 35 to 37° C = 94 to 98° F. The bottles were unstopped about once a day for examination, and this of course admitted air. If the mixture became putrid it at once showed an alkaline reaction. The teeth were then taken out, well washed, and the mixture renewed. The mixture becomes rapidly acid and remains so (unless putrefaction to a great degree supervene) for three to five weeks. The acids present are acetic and lactic, and of the former 5 per cent., of the latter .5 per cent., were found after three weeks. The effects upon the tissues are precisely the same, both macroscopical and microscopical, as in natural caries. Of course a tooth wholly immersed is attacked all over at once, but the disintegration advances more rapidly through mechanical or inherent flaws and fissures in the enamel. Where patches of ill-formed enamel or flaws or fissures allow rapid access of agents to dentine, the decay, as in natural caries, progresses more rapidly in that tissue than in the enamel. The enamel becomes undermined, and extensive pigmentation or discolouration of the affected part commonly takes place. I exhibit teeth in which the effects are visible.

The incidence of the disease in natural caries is governed by the presence of inherent defects in the enamel, and by conditions of crowding and irregularity which give rise to retention of decomposing particles on some surfaces of the teeth. The object of my experiments was to produce caries as rapidly and as extensively as possible, and we did not care to imitate all these conditions. There can be no doubt, however, that if the action of agents were restricted to one spot, that spot alone would be affected ; and it is sufficiently evident that minute particles of acid-forming *debris* of a character such as adhere to the teeth in the mouth would be much slower in their action than a mass of matter such as we have employed. We have, however, found that the rapidity of the disintegrating action in different teeth is governed by the structural qualities of the tissues. Ill-made enamel yields much more readily than well-formed ; and globular dentine is much more rapidly invaded by organisms and destroyed than tissue of better structure. Cement resists longer than enamel, but at length gives way and allows the dentine beneath it to be invaded. The experiments have been mostly made upon sound teeth : but we found that with carious teeth the decay has continued ; and if the cavity were previously excavated

decay attacked first at that point and advanced most rapidly through the exposed dentine.

Pigmentation or discolouration, as already stated, is present, and it is found also that the carious dentine readily takes up stains introduced such as are often admitted to the mouth in medicines or articles of food. Staining in natural caries is no doubt often due to this cause. The phenomena attending the invasion of organisms and their proliferation along the tubes differ in no respect from natural caries. The "zone" is present, also "pipe-stem" appearance. Another appearance—which also occurs in natural caries—to which my attention was first directed by Mr. Mummery, but which is described and figured by Dr. Miller, is discoverable. This is an appearance which at first sight looks like "pipe-stem" dentine in vertical section, but on close examination proves to be a distinct phenomenon. The sections do not take stain as do the "pipe stems." The tubes seem dilated and filled with highly refractive bodies. These bodies are cylindrical in shape, and they split up into fragments of varying length. It is possible, sometimes, by squeezing a section, to force these bodies from the orifices of tubes. Transverse sections of this altered dentine are also to be obtained. They resemble "pipe stem" dentine, but the outlines are smaller in circumference and the refractive bodies occupy the tubes.

The organisms are best displayed after staining with aniline violet. The colour can be washed out of the tissue by spirit after being fixed in the organisms by treatment with iodine—potassic iodide solution. To show tissue changes the sections can be then stained with orange rubin. This differentiates the altered tissue beautifully. Unaffected dentine shows deep red, the "zone" faint pink, "pipe stems" red with lighter centre, and dentine in last stage of softening light yellow. I think it will be admitted no more exquisite preparations have ever been seen than those cut and stained by Mr. Pound, some of which are exhibited this evening; and I wish once more to express the deep obligation I am under to Mr. Pound, without whose aid I would never have undertaken the task of examining the pathology of caries.

The artificial production of caries may be perhaps considered a crucial experiment, by which the last shreds of doubt as to the essential character of the disease must be destroyed.

Within late years controversy on this subject has died down, and I doubt if it will be ever revived. At any rate if it be, I

shall take no part in it. I have said my last word on the subject, for I feel that few facts in the range of science are more convulsively demonstrable than those concerning the causation and nature of dental caries.

I believe there are still some individuals among civilised and enlightened peoples who hold that the earth is flat, or that the sun revolves round it. I don't know whether anyone finds it worth while to controvert such views; at least a discussion of them could not be considered very practical. It is not likely that the laws of navigation will be modified in accordance with such ideas. Similarly, it is not at all probable that the well-known rules of hygiene for prevention of dental caries, or its treatment as now universally practised, will be altered because some individuals refuse to accept the verdict of science—a verdict based upon an overwhelming mass of incontrovertible evidence, derived from easily verifiable observation, and supported throughout by easily confirmable experiment.

It is now much more than a quarter of a century since Sir J. Tomes laid it down as his opinion that “caries is an effect of external causes, in which so-called ‘vital’ forces play no part; that it is to a great extent due to the solvent action of acids which have been generated by fermentation going on in the mouth; and when once the disintegrating process is established at some congenitally defective point, the accumulation of food and secretions in the cavity intensifies the mischief by furnishing fresh supplies of acid;” and further, he pointed out that “inasmuch as no characteristic appearances can be found to distinguish caries occurring in living from those in dead teeth refixed in the mouth as artificial substitutes, the hypothesis of vital action in any way modifying the disease must be abandoned *in toto*, and dental caries cannot, strictly speaking, be said to have any ‘pathology.’”

This definition of caries is in its essence not less exact now than when first penned; the knowledge of bacteriology since acquired has merely confirmed and established its truth.

I may conclude by summarising the main facts upon which determination of the nature of caries is based.

First, the anatomical characters of the teeth, and the physiological qualities of enamel and dentine, render it in the highest degree improbable (I believe it is impossible) that these tissues could be the seat of true pathological action.

Second, no morbid conditions of enamel or dentine (of

course excluding innate defects) are ever discoverable save such as are due to external causes.

Third, dentine and enamel (if it have any) derive their vitality from the pulp ; but caries in pulpless teeth is identical with the disease in teeth with living pulps.

Fourth, the presence of the destructive agents—acids and organisms—is in every instance verifiable, and their action upon the tissues can be readily discerned and followed.

Fifth, congestion and inflammatory phenomena in contiguous vascular connections—indispensable factors in active disease of avascular tissues—are not necessary accompaniments of dental caries.

Sixth, the predisposing causes of caries, the laws which govern the point of attack, its rate of progress and the macroscopical and microscopical appearances in the tissues, are each and all identical as observed in dead teeth worn as artificial substitutes and living teeth.

Lastly, decay identical in every respect with caries can be produced artificially in extracted teeth out of the mouth.

DENTAL HÆMORRHAGE.*

By Mr. J. E. EDWARDS.

Mr. President and Gentlemen.—I have selected this subject because it is included in our curriculum, and because it is a matter of great interest, and one of the most important branches of surgery. As it is a most common casualty of extraction, it should always have a chief place in our minds.

Hæmorrhage is divided into three kinds, -- arterial, venous, and capillary ; and these have again been classified according to the causes, but alveolar hæmorrhages may be said to be included under the heads of Traumatic, Vicarious, and Constitutional. All alveolar hæmorrhage may be said to be traumatic, but it would be better to confine this term to the hæmorrhage which always follows the extraction of a tooth or teeth—the primary. This usually stops after a short time, and is very simple. In the majority of cases, it ceases in about three minutes, and does not cause any anxiety either to the operator or patient. Cases of severe hæmorrhage are very rare, when we take into consideration the number of teeth that

* Read before the Students' Society, Dental Hospital, Liverpool.

are extracted, and herein lies the danger ; because the rarity of the occurrence increases the danger when it does occur inasmuch as it diminishes the apprehension, and therefore the precaution, and where a case of prolonged hæmorrhage does occur, the operator is at a loss what to do, and the patient loses a greater quantity of blood than would be done, were he ready to cope with the flow, and the longer a case of hæmorrhage is allowed to go on before it is treated, the more difficult it is to treat.

Secondary hæmorrhage is more complex, but it is distinct from the condition of hæmophilia, inasmuch as it is dependent on conditions which are merely temporary, and which make the patient for the time being, a hæmophile. Even experts have fallen into the error of putting down all hæmorrhages which recur to hæmophilia. The most frequent explanation of secondary hæmorrhage is that it is vicarious to some other blood flow. Secondary hæmorrhage is not of a very serious nature, though, sometimes very troublesome ; it yields to treatment, and is not permanent.

Under the head of constitutional hæmorrhage comes hæmophilia. This is a very serious disease, and its pathology is not quite understood. The arteries have an uncontrollable tendency to bleed, and blood oozes out of the capillaries on the most trivial wound, even a scratch will cause severe bleeding, and defy all efforts to arrest it. This condition is happily of rare occurrence in this country, and has been studied chiefly in Germany, and from this we are led to believe that it is more common there than here. It is of great importance to the Dentist to know about this disease, because at any time a person suffering from it may want to have a tooth extracted, and the operator finds himself confronted with bleeding that defies all attempts to stop it, and the patient dies from loss of blood.

It is not usual for a dentist to ask a patient for any history before extracting a tooth, or he could be on his guard ; but until the bleeding does occur, there is nothing to direct his attention to the condition of the bleeder, as the person suffering from Hæmophilia is technically termed. True, there are said to be symptoms, the bleeders being usually fair, with bright eyes, and thin transparent skin, bright intellectual countenance ; but these signs are clearly of no value to the dentist, as no one would feel justified in refusing to extract a tooth on account of a patient having these peculiarities.

In a case of a suspicious nature, or in any case where many teeth are to be removed, it would be advisable to inquire into the patient's history whether there is tendency to excessive bleeding, as to be forewarned is to be forearmed, measures could be taken, to cope with the case, if a clue was obtained from the patient. Coleman mentions a case where a patient warned the dentist of the bleeding, and measures were taken to check it, which were quite successful. Some patients have been aware of this tendency to bleed, having experienced it before and after an extraction, and would rather endure any amount of toothache than have this hæmorrhage after having the tooth out.

In Hæmophilia, blood does not spurt out, but it is rather a continuous flow welling up in the socket for days, until the patient is in a very weak state. Cases have been recorded where the bleeding stopped for a while only to recommence, and no aid being at hand, the patient died from loss of blood. Tomes mentions a case of this latter kind, and though in this instance it was not fatal, it was very alarming. A patient had a lower bicuspid removed, and the blood ceased to flow from the socket in less than half-an-hour. The patient had to go a short distance by rail to reach home, but before he arrived the bleeding had recommenced, and it was some hours before it could be arrested. The hæmorrhage diathesis in this patient was very marked, and he had been dreading the operation for some time, on account of the severe bleeding which had occurred when teeth had been extracted for him on previous occasions. Where this predisposition is known to exist, every effort should be made to preserve the tooth, and it should only be extracted as a last resource, and indeed, one authority states that the dentist should absolutely refuse to perform the extraction.

The pathology, as I have said, is not properly understood, but two chief reasons advanced, are (1) the want of the property of forming a clot and (2) a diseased condition of the blood vessels. The predisposition to bleed is often hereditary, usually through the mother, in some cases through the father; and in one case recorded, where the patient died from hæmorrhage, it was thus, the father having died from an attack of epistaxis, (nasal hæmorrhage,) and the patient himself, it was found out, just before he died, had on one occasion nearly bled to death from the same cause.

It is a fact that habitual drinkers make bad subjects for

accidents or surgical operations ; their wounds, as a rule, being very troublesome, and being a long time in healing, and alcoholic excess has been put forward as a cause for some severe hæmorrhages. In a paper read before the Odonto-Chirurgical Society of Scotland, by Mr. J. B. Nicol, attention is drawn to the fact that this may be a possible cause. Mr. Nicol had occasion to see a patient, in a good position, who had ruined his constitution with drink. The first lower molar on the left side was loose and causing him a good deal of irritation, so it was extracted, and as the bleeding was no more than usual, no extra precaution was taken. The hæmorrhage did not cease, but continued in the form of a slight dribble all day and night, and the patient becoming alarmed had the socket plugged. This checked the bleeding but after a few days intermission, it broke out again, though not so profusely as before, and after being replugged, finally ceased. In this case it was noticed that the gums, tongue, and surrounding tissues looked perfectly rotten, and it was easy to believe that a slight scratch of the gums might easily set up another attack of bleeding.

I will now pass on to the various treatments employed in arresting hæmorrhage ; and upon this the welfare and possibly the life of a patient may depend. The treatment may be either local or general, and the local treatment may be said to be of two kinds—(1) the chemical action application which causes the vessels to close and hasten the formation of a clot and (2) the effects of pressure. In the case of a simple profuse hæmorrhage the treatment need not be very vigorous. Ice is a good remedy, though difficult to apply ; hot water has its advocate also, but it must be as hot as it can be borne, and not be lukewarm, as this condition tends to oppose coagulation. In more severe hæmorrhages various remedies are said to be very effective ; among these are carbolic acid, nitrate of silver, and perchloride of iron. Matico leaf is said to be a splendid remedy, and one authority states that this has never failed in his hands, even when all other remedies had failed, and when the patients appeared to be fast sinking. It is used as follows : The leaf should be immersed in water for a few minutes and then rolled up (the rough surface of the leaf outwards) with as many cylinders as there are sockets. The socket should be washed and cleaned with cotton wool, and then the cylinders should be packed tightly in with a plugger. After this, layers of wool should be packed until

the alveolus is filled a little above the surface of the gum and upon this a pad of wool about the size of a chestnut should be placed, so as to extend over the adjoining teeth, and which is pressed upon when the mouth is closed. The mouth should be kept tightly closed by a bandage passing round the head under the chin. When opening the sockets it is advisable to take away first of all the upper pad of wool and leave the plugs in longer, as hæmorrhage is likely to recommence if they are suddenly opened. Lint steeped in the various styptics mentioned may be used with success in many cases. Stuffing the socket with soft wax has been advised, under the supposition that it would mould itself into the shape of the cavity, and thus stop the bleeding, and this may be successful where other methods have failed, and is worthy of a trial. The restoration of the extracted tooth into the socket has also proved successful, especially in cases where the incisors, canines, or bicuspidæ have been extracted. In many cases syringing the cavity with cold water will remove the clot and aid the contraction of the vessels. Salter suggests that pressure on the common carotid artery on the side where the hæmorrhage is occurring might arrest it, or at least assist in the treatment, and he bases his suggestion on a case which was successfully treated in this manner at the London Hospital. A man had sustained a severe fracture of the lower jaw, lacerating the inferior dental artery, and there was a wound into the mouth, through which profuse hæmorrhage occurred. Ligature of the carotid artery was thought of, but it was found that pressure on the artery in the side of the neck by means of the thumb or points of the fingers controlled the bleeding, but on removing the fingers it immediately recurred. Several of the students undertook to keep up the pressure, relieving each other from time to time, and it was found after pressure had been sustained for two hours and a half that the bleeding had ceased. Tannin and turpentine seem to be the most successful of internal remedies, and one gentleman holds that Tannic Acid will stop any hæmorrhage caused by tooth extraction in from half-an-hour to one-and-a-half-hour's time.

In spite of every effort fatal cases of hæmorrhage do occasionally occur, and as there is an uncertainty about cases of hæmorrhage, let me urge upon you the vital importance of having everything necessary at hand; so that if a case happened, no time would be lost in treating it; for the longer the delay the greater the risk; and delay might mean the loss of a patient's life.

A WOMAN'S BUSTLE AS AN ANVIL.

BY C. M. WRIGHT, D.D.S., Cincinnati, O.

I have a new and valuable appliance in use in my laboratory which I think is patentable, but I have received so many useful hints about methods, instruments and practice from members of the 7th District Society, that I should feel ashamed of myself forever if I did not give this away to them as freely as I have received.

Years ago, when I was a student in Dr. Keely's office, in Oxford, O., we had, in an outside laboratory where the forge stood, a blacksmith's anvil with one horn broken off, weighing from one hundred to two hundred pounds, securely fixed to a block of wood as large as a butcher's block. Our sledge hammer was a ponderous affair, and "swedging" a plate was a mighty and muscular effort. When Keely or his student swaged a gold or silver plate, the people of Oxford recorded "another earthquake," the church bells, and the old university bell gave out solemn sounds from the concussion of the air and the jarring of the earth. This was my first introduction to the anvil chorus. Afterwards, in Dr. Cameron's office in Cincinnati, while our anvil was formed of a bright cube of steel set in a handsomely turned log of wood, yet when we swaged up the plate, the buildings in the neighbourhood tottered on their foundations,—ceilings caved in, chimney pots tumbled over, and general havoc was played for squares around. Dr. H. A. Smith, who was located on 6th street a quarter of a century ago, and who was then, as he is now, a gentleman of a peculiarly sensitive nervous organization, kept a private anvil in the cellar of his house and used to retire underground whenever he had a plate to swage. The surface of the earth was less agitated in his neighbourhood, but in his office muffled sounds used to come up out of that cellar, that would freeze my young blood—make each particular hair, etc. I never saw his anvil

Later as the years rolled on, I had opportunities for observing the same sort of blacksmith exercise in Dr. J. A. McClelland's laboratory in Louisville, in Van Marter's laboratory in Basel, Switzerland, in the Ohio College of Dental Surgery, and in various other laboratories.

A few years ago, Prof. Bell, a bachelor who lived in fear of his landlady's tongue, showed me "a way of swaging up a plate without knocking the plastering off of the room below." He doubled up an old railroad guide-book and holding it on his knee placed the die and counter-die upon it, and with an ordinary hammer swaged up his plates. He claimed the invention of the "railroad-guide-book-anvil."

I adopted this in my practice and was much pleased with it. At last, however, there came a time when I couldn't find a railroad guide-book when I wanted to swage a plate. I tried folding up dental journals, stiff newspapers, paper covered novels, etc., but with indifferent success. The railroad guide-book seemed to be a necessity—but "necessity is the mother of invention," and my necessity was in labour—she has produced the anvil of the future. The chorus must be left out. I obtained a woman's bustle, stuffed closely with curled hair (the bustle not the woman), to this is attached at either end a strap or band with a buckle at the end of one strap. This I buckle about my leg just above the knee as I sit at my work-bench. The convoluted, or ribbed, or corrugated surface of the bustle or cushion presents a first-class surface for holding the heavy lead counter-die. The cushion is secured to the leg and does not fall, to the floor every time you move, as did the railroad guide-book, and with a light one pound hammer I can swage any plate and not cause the slightest jarring of the house. A baby asleep in my laboratory would not wake up from the noise. It is so successful, such an improvement on the old style, so much less like blacksmithing, so neat and handy, that, now that bustles are out of fashion as bustles, I hope that the dental depot men will buy up a lot and sell them cheap to dentists as anvils.

In bridge-work, in shaping instruments on a small bench anvil, and in fact, in a lot of operations which we are doing or having done in our laboratories every day, the noise of the hammering is sometimes very trying. For all such operations the Bustle-Anvil is a wonderful improvement. If you have a small laboratory, or a case for laboratory work in your operating room, you don't want to make a noise like a carpenter driving nails, or a man riveting boilers. It isn't refined and delicate, it is coarse and clumsy. Well, hook on a woman's bustle and do your pounding on your knee. The heaviest plate can be swaged without a sensation in the leg, and the plate, too, seems to sink more readily. The force seems to be

so much better directed and less scattered. In the correlation of force, noise seems transformed into pressure. Try it. If you can't find a discharged bustle, make a cushion to fit the leg, upholster or stuff it with curled hair or excelsior, have tapes attached to it so that you can tie it round your leg, and you are fixed to avoid noise and shock.

DEATHS UNDER CHLOROFORM.

Two deaths which recently occurred in the Royal Infirmary, Manchester, were the subject of inquiries by a coroner's jury. The one case was that of a girl, aged 14, who died apparently from shock after an operation for forcible flexion of a stiff knee; the dangerous symptoms set in after the administration of chloroform had been stopped, and when the patient was showing signs of consciousness. The other case was a railway guard, aged 27, in whom reamputation of the arm was performed in consequence of secondary hæmorrhage. Death in this case was due to impaction of a piece of orange in the air passages. The coroner is reported to have stated that five cases of death from chloroform had occurred in the infirmary since the beginning of the year, and an impression seems to have existed that this large number of deaths might be in some way connected with the fact that the chloroform recently employed had been obtained from a different manufactory. Of the five cases referred to, the anæsthetist informs us, two were cases of death from chloroform pure and simple, two were cases of impaction of vomited matter in the larynx, and one was the case of the girl above mentioned, who died some hours after the operation. From inquiries we have made, it would appear that there is no ground for supposing that the chloroform used was of inferior or dangerous quality; on the contrary, it was probably of at least the average purity.

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THE HYGIENE CONGRESS.

FROM the 10th to the 17th of next month London will be the scene of the seventh International Congress of Hygiene and Demography. Other cities, Brussels, Paris, Turin, Geneva, the Hague, and Vienna, have in turn been visited, and now the Congress meets with us. That it has caused wide-spread interest, and elicited considerable support almost goes without saying, for not only are the subjects on which the Congress deliberates of interest to those who make these matters their special study, but they are of interest to the laity, to those who look at them from a general point of view, the standpoint of the Public. As members of the Public, Dental Surgeons will, therefore, take an interest in all the sections into which the Congress will divide itself, whether of the first division, Hygiene, or of the second, Demography. We share the common interest in each of the sections of Preventive Medicine, Bacteriology, Relation of the Diseases of Animals to those of Man, Hygiene of Infancy and Childhood, Chemistry and Physics in relation to Hygiene, Engineering in relation to Hygiene, Naval and Military Hygiene, State Hygiene, Health Statistics and Industrial Hygiene, in each and all of these we, as men, have something in common. But in addition to the general interest, we, as Dental Surgeons, may take a special part in the section devoted to Bacteriology, and in that dealing with Childhood. The first appeals to us from a scientific point of view, for those who would completely

understand the diseases we treat, and the methods we adopt, must have at any rate an elementary acquaintance with this subject ; moreover, those who attend will not find themselves out in the cold, for on Friday, August 14th, two papers will be read dealing with our special domain : the first by Prof. Miller, of Berlin, on "The Mouth as a source of Infection," and the second by H. Sewill, of London, on "The Bacteriology of Dental Caries." This Section will meet in the rooms of the Royal Society, Burlington House, and will certainly claim the attendance of all Dental members. The second section, that dealing with children, should also claim a paper on the value of teeth to children, and the imperative call there is that there should be some better method of ensuring that the teeth of children should receive the attention they so urgently call for. There certainly is no means of attaining and preserving health more within reach than a careful attention to the teeth of children. The thing is so apparent it seems almost foolish to talk about it. If a child does not have its teeth attended to between the ages of six and sixteen, and through this lack of attention they decay, not only will its health be interfered with by the pain and discomfort incidental to caries of the teeth, but it also enters on the adult state handicapped without the proper means to masticate its food, in other words the body will not be properly nourished ; how then, can it be healthy ? It has been over and over again urged that there should be some compulsory examination of the teeth of the poor, say of board school children, but so far no steps have been taken. Surely this is a subject eminently fit for deliberation before this Section, and the Congress is surely the right place for giving publicity to these views.

Social arrangements seem not to have been forgotten, are they not an inseparable part of the Congresses. There are *Conversazioni* at the College of Physicians, at the College of Surgeons and at Guildhall, a Garden Party, a Dinner and sundry other functions, whilst most public buildings will be open for the inspection of members.

SOME time since we discussed the question, whether or no it were desirable to allow membership of the Odontological Society to entitle the member to the use of the affix M.O.S. as a badge of merit. We leaned to the view that it was most certainly not desirable. Now comes a curious commentary on such a scheme from the discussion at the Chemical Society. As is well-known the F.C.S. is used by its possessors as if it certified a knowledge of Chemistry, yet we have it on the authority of a late President that "the letters F.C.S. does not imply chemical knowledge and experience, for there are many in the Society who have neither." This feeling seems to have been growing, and those who are desirous of making the fellowship of the Society an honour to be coveted, took action at the last meeting and moved an alteration of the bye-laws, so as to enable this object to be attained. It was, however, met by an amendment, and a discussion ensued, which reminds one more of Bret Harte's description than of our preconceived notions of what a learned Society's meeting should be. The motion was lost. Now, it matters little to us what is the value of the F.C.S., but surely it shows the absurdity of a man using the membership of a Society as an honour, where the qualification for membership is just ordinary respectability and nothing more.

WE are sorry to note that the *Pharmaceutical Journal* of Australasia has admitted into its columns a most glaring advertisement of some man calling himself a dentist, in which, among other blarney, the price of "sets of teeth" is stated. We should have ventured to hope that this Journal would have rather helped to put down unprofessional conduct than have itself participated in it.

French geologists have made several important discoveries in Tunisia, and the latest is the jaw bone of a mastodon,

which was found recently by M. Gaudry at Cheri-Chera, while examining some ancient aqueducts. The extinct animal which furnishes the fossil is believed to have been the *Mastodon Angustidens*, of Cuvier.

We gave one curious letter recently, here is another supposed to have been received by a doctor from a fellow country physician, is taken from the *Elk Hart Review* (Indiana) :—

“ Dear Dock, I hav a pashunt whos phisicol sines shoes that the windpipes has ulcerated of, and his lung hav drop intoo his stumick. He is unabel to swoller and I fear his stumick tube is gon. I hav giv hym evrything without efeckt. His father is welthy, Onerable, and influenshal. What shall I due. Ans. buy returne male. Yours in neede.”

WE hear an important case will shortly be brought by an Assistant before one of the London Courts which will greatly interest the Dental Profession (Principals and their Assistants). The Assistant was engaged a month on trial and paid a weekly salary, and at the expiration of a few months was discharged with a week's notice ; he claims a month's notice, and sued the Principal for one month's salary. We doubt if the decision of the case will be a future guide to the Profession, at any rate the opinion of the learned Judge will help considerably those who are in doubt as to their rights in such cases. It is hoped the case will not be settled out of Court, as most similar cases are.

Abstracts of British & Foreign Journals.

IMMEDIATE ROOT-FILLING.

By J. A. LIBBEY, D.D.S., Pittsburg, P.A.

FIRST, place the rubber dam on the tooth and keep others for convenience, ligate each tooth exposed to view, to be certain of excluding all moisture and prevent alcohol or chloroform from escaping into the mouth, and open into the pulp-chamber so as to get as direct access into canals as possible. With a Swiss jeweller's broach, annealed quite soft, explore the canals, and then with a few fibres of cotton wrapped on the broach clean out the decomposed tooth-pulp. This should be continued until the cotton fibres show very little, if any, moisture. Then use a permanganate of potash solution, one drachm to the ounce, dipping the broach and cotton into it, and introducing it into the canals, repeating this until it shows no discoloration. Second, with an abscess syringe alcohol is injected into the canals; then dry with hot air, repeating once or twice. The best hot-air appliance I have used, is the compressed air-cylinder and accompanying apparatus, demonstrated at a previous meeting of this society by Dr. Register. When thoroughly dried, inject wood-creosote into the canals, either with syringe or broach and cotton, and with a bare broach assist it to the apex. Then inject sufficient chloroform to fill canals, and use broach again to assist in expelling the air if any should be left in the canal. This is done to exclude the air, and as a carrier for chlora-percha. Before the chloroform has time to evaporate, inject chlora-percha into the canals, and fill the cavity about half full. Then stretch a piece of heavy rubber dam over the cavity, and hold it in this position, and with a ball-burnisher tap at first lightly over the cavity, then increase the force, but not sufficient to puncture the rubber, this will force the chlora-percha into the canals. I am indebted to Dr. Whitesides, of Youngstown, Ohio, for the use of the dam in this manner as well as other hints in this method of root-filling.

With gutta-percha points, previously prepared, of suitable size inserted into the canals, with nerve-canal plugging instrument pack as thoroughly as possible; then warm a piece of

gutta-percha of sufficient size to cover the bottom of the cavity, and use a ball-burnisher vigorously. If the patient shows any sign of pain from the pressure, I desist at that point, feeling satisfied the gutta-percha has reached the apical foramen. I usually fill the cavity with gutta-percha and make an appointment for permanent filling.

If there is a fistulous opening on the gum, I try in every case to have the chlora-percha make its appearance through it on the gum.

Now, you will observe I have not classified particular cases. I care not whether it be—

1. Those which are in a healthy condition.
2. Those which are in such a state that slight causes of irritation may excite peridental inflammation.
3. Those of which the peridental membrane is inflamed ;
or
4. Those which have been the subject of alveolar abscess, and which are discharging through a fistulous opening.

The following cases, it seems to me, will be sufficient to prove my assertions .

Miss S., aged sixteen ; light hair, light blue eyes ; called latter part of April ; left inferior first molar with large coronal cavity ; pulp almost devitalized ; tooth quite sore to the touch ; extracted the remaining portion of pulp, and treated with wood creosote on cotton placed loosely in canals, and closed the cavity with cotton saturated with sandarach varnish. The patient returned a few days later with slight soreness ; the treatment was repeated as at first. This treatment was continued, alternating with creosote and iodoform until the fifth treatment. On Friday, May 9, patient returned, and complained of increased soreness to the touch, worse than at any time since first treatment. Up to this time I had not sufficient confidence in immediate root-filling to attempt it with this class,—No. 3. I concluded to fill the canals at this sitting, and filled the cavity with gutta-percha. On Sabbath afternoon I passed her home and saw her sitting on the porch ; she called me and said, “ I wanted to tell you my tooth is all right, the soreness is all gone ! ”

Filled permanently June 3.

2. Mr. R., aged about forty ; occupation merchant ; called May 12 ; right superior cuspid quite sore to the touch, and upon exploring with a broach in the canal pus flowed out followed by slight bleeding ; no fistulous opening. I filled

the canal and cavity with gutta-percha. The patient complained of increased irritation that evening, but next morning was much better, since which time there has been no soreness.

3. Miss D., aged eighteen; filled root-canals of right inferior first molar May 13. She had previously been treated five or six times. She was compelled to remove the cotton and sandarach within a few hours, with the exception of the last two treatments. Upon removal of cotton, pus flowed into cavity. This was the condition at this date. No irritation after filling canals.

Filled permanently May 20.

4. Had been treating left superior second bicuspid for Mr. V., aged forty, for the past year, and had closed up temporarily three or four times. Inflammation of the periodontal membrane continued. Called May 22 by appointment, and wanted to change his engagement on account of the tooth being sore to the touch, filled root at this sitting as described above. Called July 11; said the last treatment—*i.e.*, May 22—was the best yet. After the next day there had not been any irritation.

5. In the clinic alluded to in the opening of this paper, the patient, a young lady, aged about twenty, the tooth filled at that time was the right superior first molar, and had not had any previous treatment. After the roots were filled, I prepared the cavity on the mesial surface and filled about half full, using hand mallet, with soft gold-foil, No. 4.

I selected this patient for the clinic because on May 17 she came to me with right superior central and both laterals mere shells, and with fistulous openings on the gum. I commenced to open into the canal of the central incisor. I treated with creosote and closed the cavity with cotton, saturated with sandarach, and made an appointment for the 24th. She came back next day with swollen face. I removed cotton and recommended roasted figs on the gum.

The next week, at the time appointed, I filled all three roots, forcing the chlora-percha through the fistulous openings. May 3, I placed crowns on the three roots. At the time of the clinic, the fourth Thursday of June, all had a healthy appearance: the pink gutta-percha could be seen under the mucous membrane over the left superior lateral, as members here can testify.

International Dental Journal.

DENTISTS.

By Dr. S. F. DUNCAN, Joliet.

In casting about for a subject to present to the notice of this body, it occurred to me that perhaps something aside from discussions of a scientific nature might be beneficial and wholesome. This being the beginning of the second quarter century of our existence as a society, would it not be well for us to take a look about us and consider whether we are doing as much as we should for the elevation of our calling? That there has been great and rapid advancement in dentistry as a science within the past few years, can scarcely be questioned: but in our greed for scientific knowledge is it not possible that we have to some extent lost sight of our advancement to a dignified standing among the learned professions? Have we not been receiving into our ranks men who are not a credit to the profession in any sense of the word? Men who care for nothing but the "Almighty Dollar" and are not very particular as to how they get it: Men who do unprofessional advertising and slop-shop work—at low prices but twice what it is worth: Men of undignified personal conduct who care nothing for their own professional standing nor for the standing of the profession. I would say, however, that all of these men are not of the slop-shop variety, for some are skilful in their manipulations and above the average in their knowledge and treatment of diseased conditions; at the same time they do not care if there be a code of ethics, or whether they are called doctors or barbers, so long as they by their questionable methods rake in the shekels. These individuals are not found in the large cities only, but in smaller cities and towns.

Now somebody is to blame for this state of affairs. Who is it? Is it the society, the college or individuals? In my opinion all are more or less to blame. As individuals we are responsible for the class of persons we encourage to enter upon the study of dentistry. Too many students are taken simply because the dentist wants an office boy without paying wages, without considering whether he is a person of steady studious habits, with sufficient preliminary education and ability to take up and appreciate the scientific and technical

studies of dentistry, or the ambition to rise in his chosen calling.

The dental college or the private preceptor should exercise the greatest caution as to the kind of students admitted. The student should first of all be a person of good moral character and have the necessary preliminary education, with a natural inclination to mechanical art : for the dentist is not only a doctor but a mechanic—the latter predominating. He should be a person of good taste and have a liking for the beautiful, as he is also to some extent to become an artist.

I sometimes think our colleges are in this matter. It would seem that some of our institutions admit students who have none of these qualifications. Some of them cannot even read or write the English language at all correctly. I learned of a case not long since in which the applicant did not answer a single question of the very easy preliminary examination to which students are supposed to be subjected previous to being admitted to a college of dentistry, and yet he was passed and I suppose they made a *thing* of him which through courtesy to his alma mater we are obliged to call a dentist.

Too many of our colleges seem to be after the "Almighty Dollar" rather than seeking the highest good to the profession. Numbers instead of quality seems to be the leading object. Not only this, but they teach by example if not by precept that which is in direct opposition to our code of ethics. They advertise in glowing terms in the daily papers the advantages persons may enjoy by having their natural teeth treated and filled or artificial teeth constructed at the college. "No charge except for cost of material ;" "all work free," etc. In this these so-called institutions of dental learning are teaching those under their instruction not only unprofessional advertising but also deception ; for while they advertise fillings and plates at cost of material, they get almost if not quite as much for their work as the average country practitioner who labours early and late to make an honest living for himself and those dependent upon him, and does what he can to uphold the dignity of the profession by adherence to its code of ethics. If this is professional conduct for the college, why is it unprofessional for the individual? Are we as a society and as individuals using our influence in the right direction if we fail to openly condemn such institutions which are doing under their charters what practitioners may not do under the restrictions of our code? At its last meeting the "Central

Illinois Dental Society" passed by a unanimous vote resolutions condemnatory of the unprofessional course pursued by our colleges, referring particularly to advertising; and it seems to me that such a body as this should not be behind in this important matter. Said a college graduate to me—one who had been in practice a number of years, "I commenced the practice of dentistry wrong. If I had it to do over again I would advertise until I got a paying business established and then I would become professional, as Drs. so-and-so have done. They used to advertise extensively, but after they got paying practices established became ethical, joined a dental society and are now in good positions in colleges." My friend did not add, however, that these same colleges were advertising for both students and patients, so that after all our professors have not become so very ethical. They have only changed their tactics, and in such a way as to be recognized as O.K. by dental societies without coming up to the spirit of the code.

Of course in our colleges students are taught in lectures that it is unprofessional to advertise; but what does this amount to if he, when he delivers it, does not practice what he preaches? Example is good to enforce a precept taught. Not long since, I saw the advertisements of two dentists (graduates of advertising colleges) painted on fence-boards along the highway. Why not?—the college advertises, why should not its graduates? A stream should not be expected to rise higher than its fountain head. Now, gentlemen, cannot we as a society lend our influence in some way to bring about a better state of affairs? Ought we not to refuse to recognise not only individual practitioners, but colleges as well, that advertise in an unprofessional manner? It seems to me that colleges should be allowed no more liberty in this direction than practitioners.

Should not we as individuals encourage a better class of students to enter our ranks, and discourage those who have not the necessary preliminary training nor the natural ability to become successful professional men? Cannot we in this way do something at least to make our profession more noble? A dentist should be all that is implied in the word gentleman. He should be an earnest devotee of his chosen profession—not for money, but for the love of his calling and the good of humanity; a man of high morals, noble, ambitious, temperate, honest. No man has a greater need of patience, forbearance,

charity and other virtues than the dentist ; and it would be well for us all to cultivate them. Under the prevailing circumstances the legal necessity of a dentist possessing a diploma from a dental college does not meet the case. No matter how many diplomas one may have, it does not make him any better as a practitioner, unless he has the qualifications general and special that go to make up a truly professional man.

The law is powerless to aid us in this matter. It is for the society, the individual and the college to eliminate the bad elements. Of course it can only be done by exclusion. It will be some years, perhaps, before the good effects will be felt to any great extent ; but if it were possible for colleges to-day to say, "None shall enter our doors who are not thoroughly competent to enter practice ;" and if they could be empowered to rescind the diplomas of their graduates found guilty of unprofessional conduct, it would not be many years till we could take our stand beside the medical profession without ridicule, and without anxiety as to whether we shall receive proper recognition as professional brethren.

Trans. Illinois State Dent. Soc.

TREATMENT OF PROXIMATE SURFACES.

By W. H. DWINELLE, M.D., D.D.S.

WHEN you have restored opposing surfaces of teeth to their original contours, so that their approximal sides meet at their largest diameter, taking care to faithfully close all the *joints* of their walls down to the very surface of the enamel and Nasmyth's membrane, which, as you know, is akin to fluor-spar, whose integrity fluoric acid alone can impair, you have virtually restored it to all its functions as of old and secured it in its position in the arch, and have done all that art can do and reached the highest approximation to nature. It seems to me to be folly for any one to question the wisdom of this course and advocate in its place the mutilation of the teeth and flat filling with exposed enamel and dentine borders, together with the mechanical and physical disadvantages that

always follow operations of this character. It has been objected that teeth when contoured become thereby frail and are easily broken down and destroyed. In a treatise I wrote on this subject in 1855, when contour fillings were first advocated, I demonstrated that by proper anchorage and undercutting, the teeth are so locked and banded that the crown becomes stronger than by treating by the old methods. In case of treating a tooth that has lost its vitality, the pulp-cavity can be so utilized that a broad column of gold can be built up from its centre that will be sufficient to enable the contour to resist any force it might meet with.

I frequently see contour fillings made in this city more than thirty years ago which are as perfect to-day at their cervical borders and in all their appointments as though they had been completed but yesterday. Many of these have been seen and approved of by gentlemen present.

I cannot approve of the practice of slicing off a quarter or third of the enamel and dentine from a tooth and leaving the remainder to the possibilities of a flat filling. When we consider the construction, economy of, and the relation to, and position of the enamel rods, it would seem like displacing the key-stone of a succession of arches, thereby endangering the entire superstructure.

To those who contend that flat fillings are superior to the contour, which restores the tooth to its original form and function, I would simply say that they assume that a fraction of a tooth is superior to the original tooth itself. Any deviation from the strict construction of the *contour* must be on the ground of *expediency*, which we admit qualifies every operation that passes through our hands, but that a duplication of nature by art is superior to a partial success in that direction, it seems to me, is admitted by all.

I could refer to some of the objections to flat fillings, among others that all normal articulation is virtually broken up, thereby bringing with them a train of evils apparent to every one, so that teeth thus treated lose their character as teeth in a large sense, but I forbear.

The discussion of this subject is suggestive of the old inverted aphorism that "a part is greater than the whole!" I think I cannot better conclude this brief article than by quoting, *first*, from Dr. Perry's paper, where, after reviewing the subject of contours in a manner both exhaustive and entertaining, he summarizes the whole by saying, "Get free edges, if possib

for your approximal fillings, and shape them to the original outline of the teeth ;" and, *secondly*, from Dr. Allan's very able paper, read before the annual meeting of the First District Society, January, 1890. In commenting on this afterwards, Dr. Allen said, "I am sorry my meaning has been lost. Read between the lines.

"I intended my paper to be a strong argument in favour of contour work. I am ready to say that, where all indications are favourable, the contour work is both theoretically and practically the best."

This is all we contend for, and admits the whole question.

If not practical and inexpedient, do not do it. If practical and expedient, *do it!*

International Dental Journal.

SEVERE EFFECTS RESULTING FROM CONTACT WITH A JELLY-FISH.

By J. BURNETT LAWSON, M.D., Rothesay.

DURING the early days of August of last year countless numbers of jelly-fishes were to be seen in Rothesay Bay. They attracted considerable attention, and were a source of interest to people upon the piers, the esplanade, and the shores, but the experience many bathers had of them was of a disagreeable, and in many cases of a painful character. I was consulted by several persons who had received stings from them, but in all but one case the effects were local—either a hand or foot, arm or a leg, that had come into too close quarters with the floating "umbrella." The chief symptoms were slight swelling, stiffness, redness, and an intense tingling sensation.

The exceptional case referred to so much impressed the victim and myself with the discomfort the jelly-fish was capable of producing, that I noted the more prominent symptoms.

On Wednesday, 6th August, I was asked urgently to see a visitor (Mr. J.) residing in Battery Place. On going, I found

him evidently in great distress, and suffering from an unusual train of symptoms, which he attributed to the effects of an encounter he had had with a jelly-fish when in bathing about an hour previously. When swimming out from the bathing place, considerably beyond his depth, his head and neck came into contact with a very large jelly-fish. He experienced some difficulty in getting clear of it, and in his endeavour to do so he had to use his right hand and arm; he had to dive twice, and in doing so one of his feet came into contact with it. He was also of opinion that he had swallowed some of the water in the immediate neighbourhood of the fish. Getting on shore he experienced a painful tingling sensation all over the parts which had been in contact with the fish, as well as in the eyes, the nostrils, the mouth, and throat. He was under the impression that the use of the towel intensified the effects.

When I saw him he was lying on a bed writhing in agony. The face and neck were flushed and congested, and the conjunctivæ suffused. Being a most intelligent man, and quite familiar with anatomical and physiological terms he was able to describe lucidly how he felt. He said his face and neck, as likewise his arm and leg, tingled so painfully that he could only describe it as if he had been stung with nettles, but their effects intensified a thousandfold. The eyeballs felt fixed, and the conjunctivæ burned so much that he could not bear to open the eyelids. The face and lips generally felt stiff and swollen. The nares and soft palate, particularly on the left side, were similarly affected. The nostrils, mouth, and throat felt dry, and the saliva suppressed and ropy. The larynx he felt as if it were blown up like a bladder and immovable. The alimentary canal felt all affected; this, he thought, might be due to the swallowing of water in the neighbourhood of the fish. He felt a burning, uncomfortable feeling in the abdomen, which in the lowest part, over the region of the abdomen, amounted to a disagreeable toothachy pain. The right foot, which had been in contact with the fish, had the intense tingling sensation, which was almost intolerable, about the toes, but, in addition, he experienced a pricking sensation in the muscles of the lower extremities, which, later on, became stiff and felt numb. The temperature and pulse were little affected. With a view to relieve his immediate sufferings I administered several ounces of fluid magnesia in milk, which

was to hand, applied a cooling lotion to the face, and recommended a hot bath.

I saw patient about eight hours after, when he stated he felt considerable relief from the hot bath and other means. The tingling and stiffness were almost gone from the superficial parts, but he still felt a stiffness and numbness in the calves of the legs. He also mentioned, what struck him as peculiar, that the right arm, which was badly stung, after the hot bath sweated so profusely that he had to change his shirt three times.

Glasgow Medical Journal.

WHAT SHALL BE DONE WITH THE CONDEMNED PULP?

By CHARLES P. PRUYN, M.D., D.D.S., Chicago.

The proper treatment of the dental pulp is a subject that, perhaps, has elicited more thought and discussion during the last score of years than almost any other subject pertaining to the practice of our art. And without a proper conception of the anatomy and physiology of this organ, all remedial measures and appliances will prove futile in the treatment of diseased condition.

It is seldom that we pick up any of the dental journals without noticing in the table of contents a paper relating in some way to the discussion of this subject.

About fifteen years since, the profession generally were capping pulps in all conditions of exposure, regardless of the conditions of the part to be operated upon, the condition of the blood, or the condition of the nervous system of the patient. Blind empiricism was the method pursued by nearly all; simply following a rule or method that some one had suggested or had tried and had reported favourable results therefrom.

I well remember the first year I attended this society, which was in the year 1876, when our meeting was held at Galesburg. I was then astonished at the claims made by a

large number of the gentlemen who took part in the discussion that year, who claimed to be saving such a large number of pulps by the use of oxychloride of zinc. The most of these gentlemen were older than myself, and described their methods of treatment with great fluency ; and it seemed to me that if the general consensus of opinion was so favourable to capping and preserving the pulp under such varied conditions, that it might be possible for me, a young dentist, to follow the methods advocated. I did so. In many cases to the sorrow and regret of both my patients and myself, as time proved. A few years later the subject of capping pulps was hardly touched upon by this society. Other subjects seemed to be of greater importance. A few years later still, and many of these gentlemen who had previously reported such satisfactory results from capping seemed to have changed their minds as they freely admitted that many failures had resulted. So that for a time the pendulum seemed to swing to the other extreme ; that is, to devitalization and removal, rather than to attempt to cap the pulp under any circumstances. But now we have, I think, arrived at the golden mean between the two extremes, and are in a better condition to understand and scientifically treat this important organ.

The former method of capping by considering the local conditions only, has been the reason why pulp capping has so fallen into general disrepute among a large number of the profession. But now as we have become more thoroughly educated, so that we are the better able to apprehend and comprehend the different signs and symptoms of diseased conditions which affect the whole organism, are we the better able to satisfactorily treat disease.

I think I realize to a great extent, however, that specialism is very apt to dwarf our mental vision, so that the specialist is often accused of seeing only just that particular part of the body which he is accustomed to treat and nothing else, thus wholly losing sight of the complex relation of things, and of how one diseased member of the body may seriously impair the usefulness of another member, even quite remote from the cause ; and it is upon a knowledge of the reflex conditions, that prevail in the human body, that the physician become an expert in diagnosis and prognosis. How easy it is^s to become what is known as a machine doctor, who has a certain form of prescription for nearly all diseases. How easy it is to fall into a rut and become a machine dentist, who per-

forms all operations after one stereotyped plan. I well remember the advice given me by one of my medical teachers, a noted man, a savant of the savants, which was this : In the treatment of all diseased conditions, always remember these three things : First, the condition of the part ; second, the condition of the blood ; third, the condition of the nervous system. If we eliminate only one of these three from the tripod our structure must fall ; but with the three standing together, we may erect a knowledge of the conditions that prevail which will enable us to apply our art and thus save, where otherwise we would destroy.

But more directly to the subject. This subject of "what shall be done with the condemned pulp" was given me a few days since without my solicitation. I was requested to take this subject and fill the place of another, who from illness was prevented from taking his part upon the programme assigned. Just what was meant by the committee who got up this subject I have failed to comprehend, and I see no other way out of the dilemma than to appear as the attorney for this criminal, who, it seems, has been condemned by some authority to capital punishment. Why he has been condemned I know not ; and it behoves us now to inquire into the cause and see who the authority is that has condemned him ; to see what crime he has committed that he should be condemned. I would first ask, has he been condemned by the highest authority in the land ? That is, has he been condemned by one who has had an experience in scientifically treating exposed pulps, or has this pulp been condemned by one who has been faulty in his manipulation as well as in his knowledge of diseased conditions and has thus failed in preserving pulps ?

If we should find upon closer examination and cross-examination that this criminal before the bar of justice, has become a chronic offender so that he has caused a general disturbance of the whole nervous system, or if he is an old and hardened sinner, we should say that there was only one thing to be done, that is to let the law have its full course.

But it is possible that he has been unjustly condemned, or, rather, that this pulp is in the mouth of a patient under thirty years of age, strong and healthy, neither ænemic nor plethoric, nor rheumatic, nor neurotic, with the vital powers at full ebb, not having been injured by excesses or dissipations, which sap the vitality, or alcohol, or opium, or tobacco, with only a slight exposure and a slight amount of inflammation,

we should say that this criminal had been unjustly condemned, and that with proper treatment he might be saved for years, and again become an ornament to society and a comfort to himself and his possessors.

But if the converse of this should be true, then we should claim that he had been justly condemned. That is, even though the condition of the part should appear to be in a fairly healthy condition—with only a very slight exposure and a small amount of irritation and inflammation and congestion, if the patient were thirty-five or over, and anæmic, or plethoric, or rheumatic, or neurotic, or the recuperative processes in any wise below par, we should say that his condemnation was just and right. And now the question arises: What disposition shall be made of this criminal? How shall we dispose of him and his remains, and how shall we fill in society the place that has been made vacant by his removal?

There is only one method of devitalizing that has been generally adopted, which is by the use of arsenious acid. Other methods there are to be sure, but this has been the method most generally adopted, and, while it is open to some objections, it still does the work, all things considered, better than any other method. It has been claimed, however, that it almost always causes pain, more or less severe, lasting from one to several hours. But my experience has proven that the pain thus caused has been from a faulty application of the remedy, rather than the action of the remedy *per se*. That is, knowing the extreme escharotic action of the drug, we have been very desirous of perfectly sealing the remedy directly in contact with the pulp and thus limit its action to the pulp, rather than to allow it to ooze out and come in contact with other tissues and so do great damage, we have frequently caused simply mechanical pressure upon the inflamed pulp, which has produced the pain, rather than the action of the arsenic itself. That is, the same amount of pressure brought to bear upon the pulp without the arsenic would undoubtedly have caused nearly, if not quite as much pain. A hundredth of a grain of arsenic will do the work just as well, and even better, than a larger quantity.

Arsenic should never be applied to a pulp in an acute stage of inflammation. When it becomes necessary to destroy a pulp that is highly inflamed, the first thing that should be done is to remove the loose debris within the cavity, always supposing the rubber dam to have first been applied. Then,

if there is considerable congestion, this should be relieved by slightly puncturing the organ and allowing a small amount of blood to ooze away. Then apply an anodyne. I am not very particular what that anodyne shall be. There is a long list of remedies that would do the work equally as well. Most any of the essential oils that are commonly used would do, such as the oil of cassia, or clove, or some of the more recent remedies, such as eugenol, or terpinol, or a host of others that I need not mention, any one of which would probably answer the purpose. Let this be carefully sealed, without pressure, upon the pulp for a period of from one to three days, according to the state of inflammation and the condition of the parts. At the expiration of that time this dressing might be removed, and, if the inflammation has sufficiently subsided and the tooth has been comfortable in the meantime, an application of arsenic would be proper. This might be left in from one day to a week, according to the age of the patient. The older the patient, the longer time it might be left in with safety, although the destructive action of the arsenic will probably have taken place within a few minutes after its application. So there is no special advantage in leaving the arsenic in any great length of time. Applied in this manner, there should usually be but a very little inconvenience and perhaps no sensation from its presence.

Upon removal of the arsenic, I should advise an application of tannin and glycerine, to tan, or harden the pulp, if you please, which will thus admit of its easy removal in a whole mass, rather than in shreds or particle by particle. This remedy may be left in three or four days, and upon its thorough removal, always under antiseptic precautions, and complete dehydration of the pulp canal and dental tubuli by the use of the Woolley, or some other equally as good root dryer, a root filling might be inserted. But if there should be a failure in completely removing all of the pulp, so that there was a possibility of some shreds of animal tissue still remaining in the tooth, apply some alkaline solution, such as bicarbonate of soda or common table saleratus, or aqua ammonia, which would saponify the animal tissue remaining, or in some way render inert the disease germs that are interested in pus production, and at a subsequent sitting admit of its easy removal. Then with the use of hydrogen peroxide and some good antiseptic dressing, proceed as before to dehydrate and fill.

Another point might be mentioned. That is, always use

the rubber dam. Never use water for washing out a canal, but use $H^2 O^2$.

Another point : Never insert any instrument in the pulp chamber or canal that has not been recently sterilized. It is not a difficult matter to sterilize your instruments as many suppose. I should not advise for this purpose the use of the bichloride solution, on account of the injurious effect that bichloride has upon steel instruments. There are, however, a large number of other remedies that can be used for this purpose just as satisfactorily as a sterilizing agent as the bichloride solution. I would not for this purpose depend upon a 5 per cent. solution of carbolic acid, as it would be altogether too weak to destroy the disease germs that might be present upon the instruments when subjected to a very transient bath in the same. A weak solution of the oil of cassia, or of eugenol, or of terpinol, or of campho-phenique. Any of these remedies are easily obtained and can easily be kept in the operating case in a small, large-mouthed bottle, ready at a moment's notice to have the broaches dipped into the remedy before putting into the pulp canal.

Another method of devitalizing that is known as the heroic or "knocking out" method is warmly recommended by a number of gentlemen who have practised it. It seems, however, to be applicable only to the single-rooted teeth, although there are some enthusiasts who claim its general adoption in their practice. But I fail to see how it can be successfully used in teeth that have more than one root. I have had a limited experience in its use with the six anterior teeth, and in every case where I have used it, it has been eminently successful, and strange as it may appear, painless. This method as you know is to take a piece of orange-wood or hickory and trim it to an even, conical shape, about the size of the canal into which you wish to introduce it, and then, having previously dipped it in carbolic acid, with a quick blow drive it as far up the pulp canal as possible. Then with a little twist remove, when in most cases the pulp will come out upon the piece of wood entire. It seems almost incredible that the pulp of any tooth could be destroyed and removed in this way without causing very severe pain, but when we have the testimony of a large number of reliable men who are employing this method in their regular practice, almost daily, and the testimony of the patients who have been subjected to this treatment, we must admit that there is something about

it that we do not yet fully understand. The sudden and complete removal of the pulp undoubtedly has many points in its favour, for if it can be entirely removed at once, without the possibility of putrefactive decomposition setting in, with its long train of evils following, it is certainly preferable to the tedious and somewhat uncertain arsenical method.

I have an idea that the method of the future will be the use of the electrical actual cautery, as it seems to be correct in theory, but yet remains to be proven correct in actual practice.

The Dental Review.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Ordinary Monthly Meeting, held June 1st, 1891. Mr. S. J. Hutchinson, M.R.C.S., L.D.S., *President*, in the chair.

The minutes of the preceding meeting having been read and confirmed,

Mr. George Oldham Whittaker, L.D.S., Eng. King's Chambers, 26, King Street, Manchester, was nominated as a non-resident member.

Mr. Horatio C. Meriam, D.M.D. Harvard, 257, Essex Street, Salem, Mass., U.S.A., was, on the recommendation of the Council, duly elected as a corresponding member.

The Curator (Mr. STORER BENNETT) announced the donation by Mr. Henry Sewill of a series of specimens illustrating the production of artificial caries out of the mouth, and also stated that the supplementary catalogue of the Museum had been written up from 1884 to date. The catalogue was kept in the Museum, and might be consulted by the members.

The PRESIDENT remarked that the Society was very much indebted to Mr. Storer Bennett for the considerable labour and trouble he had expended in writing up the book.

Mr. BARRETT showed a clamp which he had requested Messrs. Krohne and Sesemann to make for him. It was used to compress a plug into the bleeding socket of a lower molar. The patient had been quite unable to keep *in situ* any compress applied in the usual manner. Bleeding had persisted for four days, but the clamp remained unmoved for thirty-six hours, and hæmorrhage was thus readily arrested.

Mr. Barrett also showed, and presented to the Museum, models of a greatly underhung bite. The patient was twenty-

one years of age, and up to the age of ten his bite was normal. The condition has not been inherited. The maxillæ are about of equal length in an antero-posterior direction. The upper wisdom teeth were not erupted; the lower wisdom teeth were of large size and articulated with the upper second molars. It would appear that the lower jaw has been thrust forward, or that the angle has become specially obtuse. Neither of these conditions, however, are now to be readily demonstrated when the patient is examined, and the cause of the deformity is somewhat obscure.

The PRESIDENT said that the clamp seemed a very ingenious arrangement for supplying the place of digital compression usually resorted to and found useful.

Mr. F. J. BENNETT thought that the last case might be accounted for by the unusual angle of the ascending ramus of the lower jaw. Being an obtuse instead of a right angle, it threw the jaw forward, and this direction once being given, its tendency was to increase.

Mr. R. H. WOODHOUSE, while commending the ingenuity of the clamp, expressed a preference for his own method of ligaturing in cases of hæmorrhage, as it was more comfortable for patients, enabling them to sleep and masticate without much inconvenience. In Mr. Barrett's case Mr. Woodhouse would have ligatured the teeth on either side, round the bicuspid in front and the second molar behind, then plugged the sockets with styptic colloid, placing a piece of cork over the plug, then drawing the tails of the silk ligature and trying them firmly. Only within the last week he had adopted this method in a stubborn case in the hospital; the patient remained some time to test its efficiency, and it was completely successful.

Mr. J. ACKERY, being called upon by the President, said he regretted to have to begin with an apology. He had hoped to bring the patient for examination at the meeting, but he was a working man and could not leave his work; the same cause had prevented Mr. Ackery's obtaining a model, but he hoped on some future occasion both to bring the patient and obtain a model. The case, which had been sent to him through the kindness of Mr. Howard Marsh, presented a rather unique condition of the right side of the lower jaw. The man was thirty-five years old, and it was alleged that he had never had any teeth in that region with the exception of an incisor—probably the central—and a molar—probably the second molar. Mr. Ackery called upon the mother, who was

seventy-three years of age, in the hope of eliciting some information which might throw light upon the case, but the old lady's garrulity and inexactness made it quite impossible to learn anything beyond the fact that the patient had had no illness which could in any way affect the jaw ; the only thing he had suffered from was fits. The case was peculiar, and was not one to be accounted for by the possibility of teeth having been removed, as the jaw itself was not developed on that side.

The PRESIDENT invited any members who had met with similar cases to relate them, and remarked that Mr. Ackery had shown so much ability in discovering and interviewing the relatives of his patient that he might perhaps be able to find out the doctor, who would possibly be able to furnish more reliable information. It would be recollected that Mr. Ackery had on previous occasions brought to their notice cases of bilateral absence of teeth.

Mr. C. ROBBINS reminded the Society that in January of this year he had presented the model of the mouth of a patient, aged twenty-one, in which there was an entire absence of central, lateral and canine on the left side. He would be seeing this patient again in the course of a few days, and would make further enquiries as to the temporary teeth. He was waiting to see if there were any more teeth to come through, as a fulness about the palate existed. As might be supposed, the jaw had a very abnormal appearance.

The PRESIDENT then called on the Secretary to read Mr. Balkwill's paper, Mr. Balkwill being unable to attend.

(See page 625).

The PRESIDENT said that in listening to Mr. Balkwill's short paper, perhaps the most striking fact was that an examination of 400 crania should not have disclosed a greater number of abnormalities than Mr. Balkwill had discovered. There seemed to be only one case of caries. There were certain differences in shape, and instances of certain additional cusps on the molars. Perhaps the most interesting case was that of the wisdom teeth not through, and extraordinary development of second lower bicuspid. It was to be regretted that there were not more models, which would have aided the discussion on the paper.

Mr. F. J. BENNETT was inclined to think after having seen the model of No. 1301, that the tooth described as a badly formed molar was a retained second temporary molar, from

the fact that it lay on a lower level than the other teeth, that the fangs were exposed, that it was carious, and also from the shape.

The PRESIDENT felt bound to confess that the same idea occurred to him, but the model being only a plaster cast he did not feel justified in making the same comment. He thought the point to which Mr. Balkwill desired more particularly to draw attention to in this case was the peculiar pinching of the lower bicuspid.

Mr. Sewill's paper was then read. (See page 629).

DISCUSSION.

The PRESIDENT said that a letter had been received from Mr. Sewill stating that his voice was so weak that any attempt to take part in the discussion would be harmful to him. It would be generally regretted that Mr. Sewill was not able to be present. With regard to the paper and the discussion of it the President felt that their chief difficulty was in connection with the specimens by which it was illustrated. He ought perhaps to explain why there were no photographs or drawings of them. The reason was that the specimens were under a high power, the objectives being mostly $\frac{1}{12}$ in. It would be necessary, therefore, that they should examine the actual specimens, and he thought it was more satisfactory upon the whole. Probably the whole meeting would be more productive of interest if they proceeded at once to discuss what had been read, and spend the remainder of the time in examining the specimens.

Mr. HOWARD MUMMERY said Mr. Sewill had kindly sent him a number of the specimens prepared by Mr. Pound. He had had an opportunity of carefully examining them, and like all Mr. Pound's specimens, they are most beautifully cut and stained. Having also had opportunities of examining many specimens of artificial caries prepared by Dr. Miller, he had been able to compare these with them. Dr. Miller's specimens showed all the points shown in the slides now exhibited, but the Gram method employed by Mr. Pound was perhaps better adapted for clearly demonstrating the individual micro-organisms than the simple staining usually employed. In his recent experiments Dr. Miller had added *meat* to the bread and saliva, and changed the mixture every three days. With regard to Messrs. Milles and Underwood's experiments, if Mr.

Underwood had been present Mr. Mummery thought he would be the first to acknowledge that in their experiments on the artificial production of caries sufficient attention had not been paid to the reaction of the solution—the alkaline putrefactive processes set up in the mixture neutralizing the acid production by the caries bacteria. Mr. Sewill said, with the exception of leptothrix. . . . all the organisms present in caries could be cultivated out of the mouth, either together or isolated.” This, Mr. Mummery thought, was very much open to doubt, in fact, Dr. Miller distinctly stated that there were organisms present in caries which could not be grown out of the mouth, and he had noticed one point of difference between artificial and natural caries, namely, that the organisms in artificial caries, did not give the violet reaction with iodine. He had noticed this some time ago, but accidentally omitted to mention it in his book. The reason he believed to lie in the fact that the organisms giving this reaction could not be cultivated out of the mouth. The pipe-stem appearances in caries, to which he had drawn Mr. Sewill’s attention, were those seen in vertical section, and he had never seen them take any stain. He did not think that the so-called pipe-stem appearances, seen in transverse section, in which stained masses of various diameters were visible, were due to the same cause as these appearances in vertical sections.

Mr. CHARTERS WHITE said that it was a subject into which he had not gone very much. In conversation during the reading of the paper he had remarked that probably the acid action of the chemical employed might prevent the pipe-stem from taking the stain very deeply. In his experience it was a very difficult thing to stain an acid preparation.

The PRESIDENT said that as Mr. Pound was present, he thought it would add very much to the interest of Mr. Sewill’s paper if they could hear him on the subject.

Mr. POUND said the majority of bacteria grew best when they had free access to oxygen was excluded. The former were called aërobic, the latter anaerobic but there were forms which grew either with or without oxygen. These were termed facultative anaerobic. The methods for studying these anaerobic organisms were very complicated, consequently this branch of bacteriology was very much neglected. No doubt a number of such organisms existed in the human mouth under special conditions, for he (Mr. Pound) had noticed that when persons slept with their mouth shut certain varieties of bacteria

seemed to predominate, and there was also an increased acid reaction, whereas in persons who slept with their mouths open the bacteria were of various kinds and the acid not so marked. As an example of a facultative anaerobic organism, Esmarch *Spirillum Rubrum* was perhaps the most conspicuous. This organism grew very slowly, formed a faint cream-coloured growth on the surface of the nutrient media, while if grown without oxygen in the depth of the gelatine it assumed a blood-red colour and grew more rapidly. He might say that he had never attempted to isolate the various organisms in the mouth, and produce caries artificially by any specific acid-forming organisms. Speaking of the morphology of bacteria only, in artificial cases there were a number of organisms resembling leptothrix in natural caries under a magnification of 300 diameter, but under a higher power by careful illumination and focussing the condensers proved them to be quite different. They were much shorter and appeared distinctly beaded. Their method of penetrating the tissue was also different, but after all these might be only phase forms in their life history. With regard to this peculiar pipe-stem appearance, it was entirely different from that mentioned by Tomes. With dark ground illumination they could be seen as standing out quite sharp and highly refractive. They could not be stained, whereas the true pipe-stems took the orange-rubin stain quite readily. They were to be found in natural and artificial caries. By transmitted light in vertical section they resembled the Anthrax Bacillus, showing the square cut ends and divisions or segments. In some of these rods there were several small still more highly refractive granules varying very much in size. Prof. Miller described these bodies, but did not state the nature of them.

With regard to the acid in the mixture used for producing caries artificially, Mr. Pound did not test it himself. Mr. Broughton analysed the mixture and found about 5 per cent. acetic acid and .5 per cent. lactic acid.

Mr. STORER BENNETT desired to add a tribute of praise to the beautiful specimens cut and stained by Mr. Pound, and to thank Mr. Sewill for having brought them to the notice of the Society. It was interesting to see that his (Mr. Sewill's) conclusions were identical with those propounded by Dr. Miller in his German work, published in the spring of 1890. It was a matter of common knowledge that the bulk of Prof. Miller's observations were published in separate papers in the *Dental*

Cosmos and *Independent Practitioner* a good deal earlier than the German work itself appeared, and it would be noticed that nearly all the observations Dr. Miller had made had been borne out by Mr. Sewill subsequently. The reason Messrs. Milles and Underwood were not successful was, as Dr. Miller stated, that fermentation was not allowed to continue in consequence of the solution putrefying, and the putrefaction resulted in an alkaline solution instead of in an acid one. Mr. Storer Bennett thought that it was due to Prof. Miller, whose work on this subject had been going on for the past nine years, that the fact should be put on record, as Mr. Sewill would himself be the first to admit, that Mr. Sewill's work was merely a verification of Dr. Miller's placed before the profession years ago.

Mr. F. J. BENNETT wished to say that twenty years ago they were on the eve of a discovery such as Dr. Miller had made. Coleman and Cartwright were experimenting with saliva and bread, but they did not notice that the solution became alkaline. Nevertheless, they were on the right tack.

Mr. G. CUNNINGHAM thought that anybody acquainted with the bacteriological action of caries would have anticipated that the discussion on Mr. Sewill's paper would not lead to anything new. With regard to some remarks which had fallen from Mr. Pound, he thought he (Mr. Pound) was inclined to exaggerate the fact that certain micro-organisms were easily cultivatable out of the mouth, and when this could not be done they were probably of an anaërobic nature. As an example he might cite one case. He referred to a brick-red growth not infrequently seen on the labial surfaces of the teeth of children and young adults. Cover-glass preparations of this growth seem to indicate that it was almost if not quite a pure culture. The bacterium was evidently aerobic, and yet all attempts to cultivate it out of the mouth had failed, the reason being that the proper culture medium had not yet been discovered. This was true also of other mouth bacteria, and therefore he thought that part of Mr. Sewill's paper was not justified. Another point upon which he wished to touch was Mr. Sewill's statement as to the presence of acetic acid 5 per cent., and lactic acid 0.5 per cent., if he remembered rightly. It would have been extremely interesting to have heard what methods were employed in this quantitative analysis. It was a well-known fact that the quantitative determination of lactic acid was a somewhat difficult matter, and thus, with other

items of chemical research, formed not the least important part of Professor Miller's investigations. Indeed, it was greatly owing to Professor Miller's training in other departments of science, previous to his entering upon the study of dentistry, that his original investigations were so reliable. Mr. Cunningham thought the term "pipe-stem appearance," as applied to the rod-shaped formations in carious dentine, somewhat confusing. The "tobacco-pipe stem" appearance as described by Tomes, was apparent in any *transverse* section of tubules of carious dentine. A *longitudinal* section of the same carious dentine presented no resemblance to tobacco pipe-stems. The further extension of the term, even with the prefix "broken" is therefore confusing when applied to the not rare but still relatively much less frequent appearance of rod-shaped formations seen in longitudinal sections of the tubules of carious dentine.

The PRESIDENT, in closing the discussion, said that the remarks had certainly been carefully limited to the title of the paper, a course which he thought had been fully justified. The opportunity to discuss vital action had not been accepted.

MANCHESTER ODONTOLOGICAL SOCIETY.

THE Annual General Meeting of the above Society was held at the Grand Hotel, on Tuesday, the 2nd June, T. Murphy, Esq., *Vice-President*, in the chair.

The Election of Officers for the ensuing year then took place, and resulted in the appointment of the following gentlemen to the respective offices.

President—I. Renshaw.

Vice-Presidents—P. Headridge, Wm. Dougan.

Treasurer—Henry Planck.

Secretaries—E. P. Collett, G. O. Whittaker.

Librarian—W. A. Hooton.

Members of Council—Wm. Broughton, Wm. Headridge, G. N. Skipp, T. Murphy, Wm. Simms, G. Holt.

Editor of Transactions—G. G. Campion.

The Hon. Treasurer, Mr. H. Planck, then presented his Annual Report, which showed a balance of £71 8s. 2d. to the Society's credit.

The new President having taken the chair,

Mr. MURPHY said he had great pleasure in moving a hearty vote of thanks to their late president (Mr. H. Campion) for his services during the past year. He could hardly find words to express the high feelings he had for him, and he was sure that those feelings were reciprocated by every member of the Society. He (Mr. Campion) had done a noble work in establishing the nucleus of a library, which would be of incalculable benefit to the younger members of the profession in future years. He thought the library would ultimately become second to none in the kingdom in regard to dental matters.

Mr. PLANCK, in seconding the proposal, gave expression to the high opinion which the members of the Society felt for Mr. H. Campion.

The proposal was carried unanimously.

The PRESIDENT said that Mr. Murphy had found it difficult to find words to express their admiration towards their late president, and he (Mr. Renshaw) found precisely the same difficulty in finding words to thank them for the honour they had conferred upon him. When he (Mr. Renshaw) was asked to allow himself to be nominated as president of the Society he said—No. He said No, for several reasons. The first and foremost was that the late president (Mr. Campion) had so admirably performed the duties of chairman as to make it difficult for his successor to uphold as he had done the dignity of that high office. He also thought that he was too young and inexperienced to occupy such a position. A third reason was that his time was already very much occupied by his official position in connection with the Midland Branch of the British Dental Association, and he doubted whether his time would allow him to fully perform his Presidential duties. As, however, they had elected him so unanimously he could only thank them for the honour they had done him, and promise to do his very best to follow in the footsteps of his predecessors in the chair. The condition of the Society was as follow:—Number of members, fifty; average attendance of members at the meetings, eighteen, with five visitors; ten new members had been elected, three resident and seven non-resident. They had lost during the year by death, one member—the late Mr. Molloy. Three members had been removed for non-payment of subscription, and three resident members

had become non-resident. He thought that was a fair indication as to the life which was in the Society.

Mr. DOUGAN moved, and Mr. P. HEADRIDGE seconded, a hearty vote of thanks to the officers of the Society for their services during the past year, which was responded to by Mr. Simms.

The proceedings then terminated.

Dental News.

LEGAL.

DENTISTRY PROSECUTION AT BLACKBURN.

On June 12, at the Blackburn Police Court, before Messrs. T. Lund and T. Walsh, Thomas Hawkins, whose address was given as 70, Audley-range, was summoned for that he did in the month of May last unlawfully take and use the name and title of "surgeon dentist," implying that he was a person qualified to practise dentistry. The summons was taken out in the name of Thomas Smith, of 21, Bedford-road, Holborn, London, but the proceedings were really taken by the British Dental Association—Mr. Janion, barrister, of Manchester, instructed by a London firm of solicitors, prosecuted, and Mr. R. Riley defended.

Mr. Janion said the summons was taken under the Dentist Act, 1878, under which any person unlawfully using the title of surgeon dentist was liable to a fine of £20. The information in this case was laid by two private persons. In 1879 the defendant was registered under the Act, but certain facts were brought before the Council, and his name was erased in November of last year. He (Mr. Janion) should put in as evidence the register, and it would be found that no name of Thomas Hawkins appeared in it for 1891; and to negative the clause in Section 31, which applied to the medical profession, he should put in the Medical Register which would show that the defendant was not a person to act as a medical practitioner. The learned counsel asked for such a penalty as would be a warning to others.

Charles Nuttall, dentist, of Rawtenstall, said he had known the defendant for 18 years, and could say that he now resided at 70, Audley-range. Witness had several times passed the house and noticed a sign over the door, "Hawkins, surgeon dentist."—By Mr. Riley: He had been a dentist since 1865.

The defendant had been in his employ, from time to time, since 1885 as a collector and canvasser. Witness said he himself visited about 50 towns. He had three places with signs outside, viz., at Haslingden, Hull, and Whitworth.—Mr. Riley : These are the only places ?—Witness : I have a place in Brown-street, Blackburn. My son attends to it.

Samuel Taylor McDober, of 428, Blackburn-road, Accrington, said he knew the defendant lived at 70, Audley-range, Blackburn. On May 12th, witness saw a plate over the defendant's door. He had seen it many times before and once since. He had a certain knowledge that he had a practice there.

This was all the evidence called for the prosecution.

Mr. Riley, for the defence, said he was not going to attempt to say that Mr. Hawkins was on the dentists' register. Evidence that he had anticipated had not been given—evidence to show that the defendant had, since having his name taken off the register, been in extensive practice. The gentleman called for the prosecution had not alleged that Mr. Hawkins was incompetent. The defendant was not going to deny that for some little time after November he kept his sign up, but he afterwards wrote to the society expressing his regret for having done so.

The magistrates, after a few minutes' consultation with their Clerk, fined the defendant 20s. and costs.

APPOINTMENTS.

John P. Roberts has been appointed House Surgeon to the Liverpool Dental Hospital.

W. Raws Birkett, L.D.S. Eng. has been appointed House Surgeon to the Victoria Dental Hospital, Manchester.

Mr. W. S. Burrows, Junr., has been appointed Dental Surgeon to the Metropolitan Provident Medical Association.

Mr. J. W. Greetham, L.D.S. Eng., has been appointed Hon. Assistant Dental Surgeon to the Home and Infirmary for Sick Children, and South London Dispensary for Women, Lower Sydenham.

VACANCY.

National Dental Hospital, 149, Great Portland Street, London, W. The post of Anesthetist is vacant, applications to the Secretary by August 15th.

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NOTES ON MECHANICAL DENTISTRY.*

By W. SIMMS, L.D.S.

THERE is no sharp line of demarcation between Operative and Mechanical Dentistry. Most of our Operative work necessitates a knowledge of mechanical principles, at any rate, and certainly some of it a knowledge of the principles of Mechanical Dentistry. Very rightly, as we consider the knowledge which dental students are expected to possess of this department of dentistry is in the future to be put to the test of examination, and one can only wonder that for so many years the student's knowledge in this respect should have been assumed rather than proved. No doubt this will increase the student's work, and make larger demands upon his time, but in the end, he himself will be the gainer, because more completely equipped to meet the demands made upon him by the public as a man claiming to understand the Science and Art of Dentistry. In this connection, one may say that the question of pupilage will probably require consideration and possibly overhauling. Such a system has obviously many advantages, and will have much to say for itself, but in view of its shortcomings, it may well be a question whether the three years which a dental student has to spend with a dental surgeon, might not with advantage be reduced to two, and the extra year added to the time a student must spend at a Dental Hospital. This would make five years as the minimum time to be spent by a student in his dental education, a time which is quite short enough to prepare him for the ordeal of the dental examination. Such a system would enable the student to spend his first year at the Hospital in acquiring (under conditions more favourable than in a private practice), a practical knowledge of many matters of which, unfortunately, he often knows too little at the

* Read before the Manchester Dental Students' Society.

time he commences his education at a Dental Hospital. For instance, the construction and adaptation of pivot teeth and metal crowns; impression taking, with a knowledge of the properties and uses of wax, gutta-percha, gum compounds, and plaster of Paris; the construction and adaptation of regulation cases; the preparation of the mouth for artificial dentures, and the choice of materials in their construction, the adaptation of dentures to the mouth, with some consideration of the difficulties to be met with in practice, and the methods of overcoming these difficulties; these, and other cognate subjects might well form material for consideration and study, during the first year of the student's Hospital career. The friendly discussion of these subjects, both among the members of the staff, and yourselves, cannot but be to our mutual advantage, and not least, one may hope to those who ere long will be thrown upon their own resources, and will have to stand or fall, according to the merit that is in them

It may be that many of those I address, are looking forward to careers as Operating Assistants (so-called), or more ambitious still, hope ere long to be themselves in independent practice, and able to delegate their mechanical work to a workroom assistant. An important part of the work done in our operating rooms, however, requires mechanical knowledge and aptitude, and it is in regard especially to work done under these conditions, to which this paper refers. We propose to discuss, for instance, the questions of impression taking; the preparation of the mouth for artificial dentures; metal crowns, in so far as they are associated with dentures; and one or two other cognate subjects.

In the preparation of the mouth for artificial teeth, the dental surgeon should have in his mind certain well-defined principles. Should stumps be allowed to remain in the mouth, or is there necessity for extraction? There can, I think, be no difficulty in satisfactorily answering this question. No stumps remain healthy and free from disease in any mouth for a length of time, unless the pulp canals are cleansed and filled. Not only so, but their retention in the mouth is uncertain, even when no pain supervenes, and sooner or later, outraged nature expels them. Their presence, either when worn under a plate or otherwise, is commonly a cause of neuralgic trouble, which may go on for years without the patient suspecting the cause of mischief. We know what

healthy teeth are, and we are familiar with the appearance of their roots when some necessity has compelled their extraction ; but healthy roots, under the conditions I have indicated do not exist. Rather do we find them commonly, nay almost universally, necrosed, the seat of chronic abscess; their apices partially absorbed, and presenting sharp points of irritation to the periosteum, or, on the other hand, more or less exostosed. These conditions are, of course, present in more or less degree according to the general health of the patient, and in centres of dense population and ill-conditions of health, such as we have in Manchester, are the more manifest. It is greatly to the credit of the medical profession that more and more they recognise the absolute necessity of referring such cases to the dentist for examination and treatment.

Apart from the pain which is the direct outcome of the ill effect produced by stumps, the inevitable presence of putrescent matter, and the development under such favourable conditions of hosts of the different forms of bacterial life, must have a very prejudicial effect upon the processes of assimilation and digestion ; functions, the efficient discharge of which are vitally necessary to the health of the whole body. It will be within the experience of every dentist, what a remarkable improvement in health often takes place in patients after the extraction of a mouthful of suppurating stumps, and being quite apparent before the artificial teeth are supplied. Very recently a striking proof of this came under my notice. A patient, long suffering from the effects of a number of decayed teeth and stumps, had all of them (thirty in number) extracted under chloroform, and notwithstanding the manifest disadvantages resulting from such an operation, gained four and a half pounds in weight in three weeks. There can be, therefore, no hesitation in affirming that, as a rule, stumps should be extracted preparatory to the insertion of artificial teeth.

There are, however, some important exceptions we should make to this rule. For instance, where roots, being in a healthy condition, or capable of being so made, can be utilized for the holding of artificial crowns, metal or otherwise, they may and should be so used. How frequently one or both of the bicuspidis in the upper jaw having come to grief, may be restored by crowning, and the necessity of a plate covering a portion of the palate avoided.

Beyond these exceptions, however, which are obvious, and

in accordance with the constant practice of you all, it is often desirable where one or several of the upper front teeth are to be replaced, and a plate is also necessary for some of the back teeth, that the roots should be retained and filled. The advantage in such cases is that the artificial substitutes can then be made the same length as the natural teeth, which have been retained and thus a better, because a more natural appearance secured. The artificial character of isolated front teeth is often betrayed by the fact that by the absorption of the gum, consequent on extraction, the teeth are of necessity longer than their natural companions. I consider, therefore, that it is good practice in constructing an artificial denture, and where several of the front teeth are among the number to be replaced, to retain the roots. The practice of cutting off the front, or other teeth, and leaving the pulp canals uncleansed and unfilled, is however, a practice to be strongly condemned. In the cases we have been considering, my own practice, where possible, is not to attach such isolated front teeth to the plate itself, but to the roots, that is to pivot the teeth in the ordinary manner. I pass round several models showing this method, which has I think several advantages :

1st.—In pivotted teeth, the gum and teeth are more likely to maintain a fixed and natural relation to each other.

2nd.—Such teeth, especially single teeth can be fitted to maintain a more natural appearance to the adjoining teeth.

3rd.—They are far less likely to be broken in ordinary wear and tear of mastication, owing to the elasticity of the periosteum.

4th.—In case the denture itself is in need of repair, it can be retained for the purpose, without materially affecting the appearance of the patient. This latter reason will be important to many patients, to whom enforced retirement, while the masticatory organs are in process of renovation, would be most objectionable.

It may be acknowledged at once that the extraction of roots or teeth, and especially in the front of the mouth, preparatory to the insertion of artificial teeth entails some amount, often a great amount, of inconvenience to the patient. The period of waiting for months until the requisite absorption has taken place is a weary one to the patient, and the prospect of it is calculated to deter patients from placing themselves in the hands of the dental surgeon. Probably, also, the hope held out by the charlatan that every desirable purpose can be

secured without extraction and its accompanying disadvantage is a reason why a portion of the public so recklessly put themselves in their hands, to find out later on how delusive the promise has been.

It is good policy on the part of the dentist, and in the highest degree to the advantage of the patient, when appearance is of importance, that a temporary piece should be worn for six or twelve months, prior to the insertion of a permanent set. If a set of teeth is prematurely inserted, it can only in the nature of the case be a temporary set, and if the patient has been led to expect otherwise, he has the right to be annoyed and disappointed, and has reasonable ground of complaint against his dentist. No doubt there are difficulties in regard to the matter. It has happened, for instance, that a patient having a temporary set made for him by his dentist at a nominal sum, chooses to retain it rather than go to the expense of a new set. In all such arrangements, it is wise and right for the dental surgeon to make an inclusive charge for the two sets. In estimating his charge, he may rightly add only a comparatively small additional charge for the first set, which, it is expected, will be only of limited service to the patient.

A frank explanation of all the difficulties and disadvantages is always desirable in these cases. The reputation of a dental surgeon is not dependent upon the making of a particular set of teeth, no matter for whom, or for how large a fee, but it is dependent upon the confidence the experience of patients justifies them in placing in him.

A temporary set is of service beyond replacing the lost organs, and maintaining a presentable appearance. When a patient is without teeth for a long time, the full natural expression of the face is lost; the labial muscles acquire a facility of motion which mars the beauty and expression of the face. This is, of course, most evident in those who have been without teeth for many years, and which cases defy a complete restoration of natural facial expression, but the deformity exists in those who have been without teeth for comparatively short periods.

I consider that usually a temporary set of teeth, even where all the teeth have been extracted, may be made within a week or two after extraction. It is always well to avoid pressure on the outer margins of the sockets, as the bone here being more prominent and sharp will the less bear covering with a plate.

My own experience is that when a temporary set is worn the absorption is somewhat less than when the mouth is left without teeth, and that the external plate of bone remains more prominent, and probably this is why a more natural expression of face remains in such cases. Of course in a temporary set the front teeth at any rate will fit on to the gum direct, pressing a little into the sockets of the extracted teeth. A set so made is a most valuable guide to the position of the teeth of the permanent set should occupy ; a disregard to this position will probably give the patient occasion to remark that he prefers the old set to the new ; a compliment which would not be very flattering to the genius of the dentist.

A few remarks about the condition of the mouth at the time the impression is taken may not be amiss. If an artificial piece has been worn previously, every effort should be made to give the mouth a rest for a day or two, and an astringent mouth wash recommended. Under such treatment the mouth will often change considerably, especially if the dentures previously worn have been ill-fitting. It is important this should be borne in mind, as it is remarkable how an ill-fitting piece, especially if worn constantly, will do all it can to make the mouth conform to itself. Especial attention should be given to upper dentures which have been made soon after the extraction of teeth, and which the patient has continued to wear, it may be for years. In many such cases, as absorption proceeds, the mucous tissue is drawn to fill the space so caused, and suction being thus maintained, the patient is deluded into the idea that his artificial denture remains perfect.

It will be fitting that I should now with your permission, say something about impression taking, and the properties of the various substances used for this purpose. I do not hesitate to make the assertion that we have no material at our command suitable for every case. There is, probably, as much in the manner of using the material, as in the properties of the material itself. How true this is, we may understand when we remember what excellent results in former years have been obtained with Bees' Wax, a material which even now is used by some dentists, but which is without doubt the least reliable of our impression compounds.

With godiva and similar gum compounds, I believe most satisfactory results can be secured in simple cases and where there are no overhanging teeth. I believe godiva to be quite suitable for edentulous cases, but not with ordinary impres-

sion trays. The gummy nature of the compound has this disadvantage, viz : that if pressure is brought to bear upon a part of the material, the effect is not confined to that part. It is almost impossible, therefore, with an ordinary tray to obtain a perfect impression of an edentulous upper jaw, especially if the soft palate is at all sensitive. The muscles of the soft palate, acting upon the overplus material which has projected beyond the end of the tray, draws the material downwards, and unfortunately this action extends one-third the way up the hard palate. That this is so may be seen by carefully examining models which have been made from impressions taken by plaster and godiva respectively. Perfectly satisfactory impressions can, however, be taken by godiva in most cases, edentulous and otherwise if a special vulcanite tray is made for each case. I can strongly recommend this method, as in some respects superior even to plaster of Paris. In making these cases, a sheet of wax is put on a model made from a godiva or wax impression, a second sheet of wax is put over this, which, after cementing a portion of wax for a handle, is flaked, replaced with vulcanite and vulcanized.

Both sheets of wax should be a little thicker than the wax as ordinarily sold, and a piece of tinned iron wire may with advantage be inserted in the second wax to strengthen the tray. The result is a tray slightly larger in all its parts than the mouth it is designed to take an impression of. On obtaining the impression quite a small portion of the compound is placed in the tray, and consequently it rapidly hardens. There is little, or no fear, of dragging, and as the tray itself fits almost close to the palate that portion of the impression is perfection itself.

Gutta-percha, perhaps, needs more care in its use than any impression material at the command of the dentist. To obtain the best results it should be softened at a heat just below boiling, until sufficiently plastic. Being now too hot for the mouth it should be kneaded in cold water for half a minute, or rolled on a towel, made wet with cold water; being now rapidly dried by rolling on a napkin, it is placed in an impression tray previously warmed, and after a moment's immersion in cold water, carried to the mouth and pressed into position, where it must be retained for from three to five minutes, when, being withdrawn, it is quickly plunged into a basin full of cold water previously placed near at hand. Gutta-percha is especially useful in cases of long or overhanging

teeth, but great care is required to prevent contraction of the material after the impression is withdrawn from the mouth.

At a recent meeting of the Manchester Odontological Society, Mr. Peter Headridge communicated an excellent method of renovating old gutta-percha. This is by simply kneading the gutta-percha in hot water, in which a piece of common soda had been dissolved.

The advantages of plaster of Paris in impression-taking are so obvious and well known, that I need spend little time in speaking about it. A special tray is desirable, and the method of rapidly making this tray was described by Dr. Betts, in a paper read before the Manchester Odontological Society several years ago, and is probably familiar to you. Practically, it is the same method as that I have described for making vulcanite trays, except that impression compound takes the place of vulcanite, and the handle is formed of iron wire. The claim made for plaster is that by its very nature, a perfect impression of the mouth may be obtained without disturbing the relative position of the hard and soft parts of the mouth. This is a fair and equitable claim, but for myself I feel bound to say that I think a moderate compression of the soft parts is sometimes desirable and advantageous, and even occasionally necessary. I have sometimes found in my own practice, that more satisfactory results could be obtained with godiva and a special tray, than with plaster. In some edentulous lower cases plaster of Paris, is however, the very best, where the soft parts seem intolerant of the least pressure.

In taking impressions of the lower jaw, especially in edentulous cases, it is well to make sure that the cheeks are pushed out, as the impression is pressed into position. Unless care is used it frequently happens that a portion of the mucous membrane of the cheek is pressed under the impression, which consequently is unreliable. Every effort should also be made to prevent the patient swallowing while taking an impression, especially a lower impression, as the action of the muscles concerned in swallowing, tilts the impression forwards. If there is a great flow of saliva, it is well also to use the saliva ejector, or draw forward the patient's head, and allow the saliva to run out of the mouth into a spittoon.

In taking impressions of the upper jaw where a choky feeling bothers the patient, almost absolute relief will be given, and the air passages enlarged by the same action; draw forward the patient's head until the face almost touches

the knees. When the impression is taken the mouth should be carefully examined, and note made of the palate, and generally of the whole surface it is designed to cover with the plate. This knowledge is desirable in all cases, and absolutely necessary in some, if a perfectly-fitting, steady plate is to be obtained. Of plaster impressions this is perhaps more true than of any other material. In many cases a hard, bony ridge is present in the medium line of the hard palate. A plate made from a model obtained from a plaster impression of such a mouth would inevitably ride in the hard bony ridge, and satisfactory adhesion would be impossible. In my experience, I have found this to be a common cause of misfit, failure is in such cases, contrary to the opinion of some, more likely to be in vulcanite sets than in gold, for in stamping gold plates on zinc models, the contraction of the zinc to some extent, though not completely, counteracts this condition.

We conclude, therefore, that though a correct model is necessary in the construction of an Artificial Denture, yet it is frequently necessary to lift up the plate from the hard parts in order that the plate may fit equally all parts of the mouth. A very good test of the fit of the denture in the mouth is to press hard on the teeth on one side of the mouth only ; if the other side remains firm and unyielding, we may congratulate ourselves upon having obtained a satisfactory result ; if otherwise then the plate does not fit equally all parts of the mouth, and the patient will be unable to masticate without his teeth becoming loose and very likely falling into his mouth.

Into the question of the fitting of bands and claws, I am not going to enter, nor do I propose to discuss how far they are an evil—a necessary evil—or otherwise; that it is a question which might well form a subject for a separate paper. But undoubtedly natural teeth to which claws have been attached do often decay, and there are many cases when the presence of one or more teeth is necessary to the retention of the plate the patient is wearing. The loss of such teeth, or even one of them would mean the necessity of constructing a new piece.

I speak of cases, which, of course, are beyond restoration by the mere operation of filling ; teeth which in some cases have already several fillings doing duty, and where possibly the buccal wall has broken down and the whole tooth structure looks like falling to pieces.

Such teeth I have found can be utilized and made of splendid

service by metal crowning, and so restored, form more effective supports for artificial plates than the natural organs, and several models I pass round, show the utility of this method of restoration. Where possible, that is where the tooth is extensively broken down, I prefer to construct a crown with a hole through the grinding surface in order that the crown may be filled with amalgam, having previously fixed two long screws into the tooth to securely hold the amalgam. Such a method is, I think, likely to be more lasting in badly broken teeth at any rate, where the progress of decay has made it difficult to satisfactorily fix a collar round the root. In teeth where the walls remain, this method is not applicable, and in such cases, the usual method of fixing the crown with osteo must be resorted to, but if the operation is to be a permanent one it is necessary that the metal should fit snugly beyond the cervical margin otherwise the cementing medium will almost inevitably be washed away and decay supervene.

From time to time we hear great lamentation over the supposed decadence of mechanical skill and knowledge among dentists. This I think is partly true and from various causes. It is not, however, wholly true, and in the future, in the hands we hope, of gentlemen like the members of your Society, it is likely to be less true. For myself, I have no sympathy with the outcry against vulcanite, the discovery of which has without doubt been to the great benefit not only of the public, but of the dental profession. But having said this, I feel bound to add that so far as I am concerned, I allow dental rubber to obtrude itself into notice as little as possible. Its appearance is far from natural, and its presence often betrays the artificiality of the dentist's handiwork. Every workman, unconsciously to himself, condemns it when he carefully cuts away from between the artificial teeth all vulcanite possible, so that none may be seen. A careful examination of a healthy mouth will reveal what an important part the natural gum plays in its relation to the teeth. Instead of being carefully chiselled away, we find it asserting itself in graceful and prominent curves round the necks of the teeth, with delicate tongues of deeper coloured gum filling up the wedge-shaped space between, the whole surface light reflecting and radiant in hues of delicate pink. Examine models of the natural mouth, and of a finished vulcanite set, and we see at once that the difference between them is not

between the setting of the teeth—it is sometimes that—but between the relation of the gum to the teeth. To obtain the best results, nature, in this particular, must be followed, and I strongly advise the members of your Society to use gum blocks or continuous gum in your future work in prosthetic dentistry, in preference to rubber, for the formation of that portion of the gum which is exposed to view. This is especially desirable in cases of very prominent gums, and even in cases where the protrusion of the gum is so great as to necessitate the setting of the teeth on to the gum itself, it is better to use teeth with mineral gum between. An American firm has recently brought out such teeth, and although the variety at our English depots at any rate is not great, they will often be found serviceable, or the ordinary blocks can be ground down until the teeth touch the gum; I have the pleasure to show a set made in this way. The limits of this paper prevent my discussing the merits of continuous gum work; I can only venture the prophecy that with simple methods of working this base there is bound to be a vast extension of its use.

I had hoped to have said something about the method of obtaining a correct bite in the mouth, but time forbids; with your permission I shall conclude my paper with some reference to articulators and the setting of Artificial Teeth. It appears to me, that all articulators in present use except Bonwill's, are constructed on a wrong principle. They disregard the natural lateral motion of the lower jaw, and substitute instead a hinge joint which often gives misleading results. Mr. W.G.A. Bonwill has pointed out that the lower jaw from its two condyles to the centre of the two lower incisors forms an equilateral triangle; the distance from condyle to condyle, and from each condyle to the cutting edge where the two central incisors meet being about four inches. The limits within which these measurement vary are very small. This tripod arrangement allows all the teeth one side being brought into use at one time. In arranging artificial teeth this should be had in view, but only in the use of an articulator made on the principle of Bonwill's, which I show—can the teeth be anatomically arranged.

If we examine the models of a set of natural teeth, placed in the Bonwill Articulator we shall discover the principles we may safely follow in arranging artificial teeth. The upper bicuspid and molars project almost one-third over the corresponding lower teeth; we see the necessity of this in the lateral motion

of the jaw. Nor is the stability and steadiness of a set of artificial teeth disturbed by such an arrangement, as at first sight we might suppose would be the case, for, as on one side the cusps of the lower teeth are brought into contact with the external cusps of the upper teeth, on the other side of the mouth the outer cusps of the lower teeth remain in contact with the inner cusps of the upper teeth. This beautiful arrangement allows the masticatory muscles of both sides of the mouth to act at the same time, thus increasing the force of mastication. The same arrangement made in artificial dentures allows the teeth of both sides of the mouth to be in contact at the same time, thus ensuring steadiness of the dentures.

Gentlemen, in offering you this paper, fragmentary as it necessarily is, it has been my object to present for discussion and criticism, some subjects of importance to those in daily practice, and not less so, I hope to you, who by this will put to the test of practical trial the stores of knowledge you have acquired in your student days.

THE REGULATIONS OF THE DENTARY ARCADES IN THE CRANIA OF AUSTRALIAN ABORIGINES.*

By PROFESSOR SIR WM. TURNER, M.B., L.D.D.,
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It is well known that in the European skull the span of the upper dentary arcade is somewhat greater than that of the lower so that the upper arch of teeth slightly overlaps the lower both laterally and anteriorly. The projection of the upper teeth beyond the lower is well marked in the region of the incisors and canines, so that when the jaws are clenched the lower teeth fit within those of the upper jaw, and the cutting edges and labial surface of the former are in contact with the lingual surface of the latter. Hence "tartar" does not accumulate on the lingual surface of the upper incisors,

* Read before the Anatomical Society, and published in "the Journal of Anatomy and Physiology."

but is prevented from forming there by the friction of the lower incisor teeth.

There is no difficulty in satisfying oneself of the accuracy of this relation in the European skull. We may do it on our own persons, or on the skulls of the subjects received into the dissecting-room. But if you wish to examine the relations of the dentary arcades in the coloured races, we find that so many of the crania in our museums are either without the lower jaw, or, if the mandible be present, have so many teeth wanting that an accurate comparison is impossible.

In the collection of seventy-one crania of aboriginal Australians in the anthropological cabinet of the Anatomical Museum under my charge in the University of Edinburgh, only one specimen has all the teeth in place ; but in a few others they are so nearly complete that relations of the two arches can be satisfactorily ascertained. By the study of these specimens I have recognised that in many Australian skulls an interesting modification exists in the relations of the upper and lower incisors and canines, as compared with the European skull.

The skull with the complete dentition was an adult male of the Narrinyeri tribe, inhabiting the country around Lake Albert, South Australia. The cusps have been worn off the crowns of the molars and permolars, and the cutting edges of the incisors had been somewhat blunted. The width of the two dentary arcades in the molar region, taken by measuring between the outer surface of the crowns of the teeth, was as follows : at 1st upper molars 62 mm., at 1st lower 54mm.; at 2nd upper 65 mm., at 2nd lower 62 mm.; at upper wisdom 64·5 mm., at lower wisdom 65·6. When the condyles of the lower jaw were articulated and placed in contact with the ridge which bounded the back of the glenoid fossa, and the teeth were clenched, the lower canines and incisors did not fit within the upper arcade; but the two sets of teeth were in contact by their cutting edges, and formed a continuous curve from above downwards. In the incisor region, therefore, the lower dentary arch projected as far forward as the upper. In the molar region the crowns of the lower wisdom did not extend quite so far back as those of the upper wisdoms, and from behind forwards the anterior surface of the crown of a lower tooth extended materially in front of the corresponding upper tooth, so that on the right side the lower canine was situated in the front of the upper, and below the upper central incisors ; on the left side, however, the lower canine and incisors were not so completely in front of their upper homologues.

With the view of determining the relative width of the upper and lower dentary arcades in the molar region, I measured all the Australian skulls in the collection in which the corresponding upper and lower molars were preserved. Including the skull above described, eighteen crania possessed the first pair of upper and lower molars, and in all the width and the crowns of the upper pair was greater than that at the lower. In two specimens the excess was 8 mm. in four, in three 6 mm., in one 5 mm., in six 4 mm., in two 3 mm.: the mean of series was 5 mm. A similar number of specimens possessed the second pair of upper and lower molars, in all which, with one exception the width at the upper pair exceeded that at the lower. In one the excess was 8 mm., in one 7 mm., in one 6 mm., in four 5 mm., in two 4 mm., in six 3 mm., in two 2 mm., and in one they were equal. The mean of the series was 4 mm. In eleven specimens the upper and lower wisdom teeth were present; in seven of these the width was greater in upper arch, whilst in four the lower arch was wider than the upper. It follows therefore from these measurements that the upper dentary arcade in the Australian skull is, with rare exceptions, appreciably wider than the lower in the region of the first and second molars; whilst at the wisdom teeth, though the upper arch is more frequently wider than the lower, in a proportion of the specimens the lower possesses the greater width.

I may state that the maximum width at the crowns of the 1st upper molars was 66 mm., and in twelve specimens the width was 60 mm. or upwards, whilst the minimum width, in one specimen only, was 55 mm. The maximum width at the crowns of the 1st lower molars was 63 mm., and the minimum width was 51 mm. The maximum width at the crowns of the 2nd upper molars was 73 mm., and three specimens were 70 mm., or upwards, whilst the minimum width was in one specimen 57 mm. The maximum width at the crowns of the 2nd lower molars was 69 mm., and the minimum width was 57 mm. The maximum width at the crowns of the upper wisdom was 75 mm., and the minimum was 55 mm. The maximum width at the crown of the lower wisdoms was 72 mm., and the minimum was 62 mm.

I have also made series of measurements of the width at the crowns of the molar teeth in European skulls. In all the specimens, with one exception, the transverse diameter at the 1st molars, in the upper dentary arcade exceeded the lower,

but in no instance was the excess more than 4 mm. The mean of the series was 20.5 mm. The transverse diameter at the 2nd molars, with two exceptions, was greater in the upper arcade than in the lower, but in no instance was the excess more than 5 mm., and the mean of the series was 2.4 mm. At the wisdom teeth the transverse diameter was sometimes greater at the upper pair, at others at the lower pair.

From this comparison it follows that both in European and Australian skulls the upper dentary arcade, with rare exceptions, is wider than the lower at the 1st and 2nd molars; but that in Europeans the excess of width is, as a rule marked as in the Australians. In the region of the wisdoms, again, in both series, sometimes the upper, at others the lower, arcade may have the greater transverse diameter. But in the European skulls the absolute width at the molar crowns was less than in the Australians, and in both sets of measurements it should be stated that the men predominated over the women. The maximum width in the Europeans at the 1st upper molars was 63 mm., at the 1st lower 60 mm.; at the 2nd upper 66 mm., at the 2nd lower 64 mm.; at the upper wisdom 68 mm., at the lower wisdom, in the same skull, 71 mm.

Anthropologists have long recognized that in the Australian crania the teeth are larger than in Europeans, especially in the molar series. Professor Flower, C.B., conducted a few years ago a research into the size of the teeth as a race character*, but for the reason stated in his paper, the investigation was confined to the upper molar and premolar teeth. He placed the Australians in the megadont group, whilst the Europeans were microdont. Owing to the limitations under which the research was conducted, no comparison, as regards size, between the upper and lower premolar and molar series is given. I have, to some extent, endeavoured to work this out in the crania at my disposal. In thirteen skulls I was able to measure the length of the crowns of the premolar and molar series in both jaws, either on both sides, or on only the right or left side. In all the specimens, with one exception, this series of teeth in the lower jaw was collectively of greater antero-posterior diameter than in the upper, in one specimen being as much as 5 mm., but the mean of the thirteen specimens was 3 mm. The actual length of the series in the different specimens ranged in the upper set from 41 to 51 mm., in the lower set from 44 to 56 mm.

* *Journal Anthropol. Institute*, November 1884.

In the same skulls I also took the antero-posterior diameter of the crowns of the three true molars in both jaws. In one skull the right upper series was 1 mm. longer than the lower, but on the left side they were equal; in all the rest the lower set exceeded the upper, the maximum excess being 5 mm., and the mean 2·8 mm. The actual length of the true molar series ranged in the upper set of teeth from 29 to 36 mm., and in the lower set from 31 to 40 mm.

Owing to the lower set of premolars and molars exceeding the upper in antero-posterior diameter, the crowns of the corresponding teeth in the upper and lower jaws in the great majority of the specimens, were not in the same vertical plane; the lower teeth almost invariably were situated partially in front of the upper, and in some cases as much as one-half of the crown of a lower true molar was in front of the crown of its upper homologue, and the anterior lower bicuspid was in apposition with the upper canine. As regards the wisdom teeth, it should be said that whilst in many cases the back of the crown of the upper wisdom projected a little behind that of the lower, in others the relation was either reversed, or the backs of the upper and lower wisdoms were in the same vertical plane.

I have also examined a number of European crania as to the relative antero-posterior diameter of the upper and lower molar series. When both premolars and molars were taken together, the lower series invariably exceeded in length the upper, the greatest excess measured being 5 mm., and the mean being 3 mm. The actual length of the series in the skulls examined ranged from 37 to 45 mm. in the upper jaw, and from 40 to 49 in the lower jaw. Similarly the lower true molars exceeded the upper in their antero-posterior diameter. The greatest excess measured was 4 mm., and the mean of the series was 2·3 mm. The actual length of the true molars ranged from 26 to 31 mm. in the upper jaw, and from 27 to 34 mm. in the lower jaw. As regards the relative position of the upper and lower teeth, the crowns of the lower molars in some instances projected only slightly in front of their upper homologues, but in others a considerable proportion of the lower crown was in front of the corresponding upper tooth. Sometimes the upper wisdom projected a little behind the lower, in others the reverse was the case.

I may now pass to the consideration, in the Australian skull, of the relations of the dentary arcades in the incisive and

canine region. In the specimen (No. 1) described at the beginning of this communication the upper arcade was seen not to overlap the lower anteriorly, but they were in apposition with each other by their cutting edges (see figure, p. 462). Notwithstanding the large number of Australian crania in the collection, only two specimens, in addition to No. 1 above referred to, had retained the whole of the incisor and canine teeth in their sockets; but in several others these teeth were only partially lost, so that one could form a conclusion how these teeth had been related to each other. In one of the two complete specimens (No. 2), an adult male from Port Stephens, N.S.W.,* the apposition of the free edges of these teeth closely resembled the condition described in No. 1, but the lower canine was not so completely in front of the upper canine as in that specimen. In the other of the two complete specimens (No. 3), an adult male from Benalla, Victoria,† there was no overlapping of the lower incisors and canines by the upper, and the crowns of both sets of teeth had been much worn and flattened by mutual friction. In an adult male skull from Manly Cove, N.S.W.‡ (No. 4), in which the right upper central incisor had been artificially extracted at puberty and the socket absorbed, when the jaws were clenched, and the grinding surfaces of the upper and lower molars were in contact, the cutting edge of the lower incisors was separated by a slight interval from that of the upper, but the lower were not overlapped by the upper, though the anterior surface of the crowns of the lower incisors was almost in the same vertical plane as the back of the crowns of the upper incisors. In seven specimens in which several of the more anterior teeth were lost, but where a sufficient number remained to enable these relations to be determined, it was evident that the upper incisors and canines did not overlap the lower. From these observations I am satisfied that in a considerable proportion of the skulls of aboriginal Australians the relations of the teeth in the incisive region differs from the prevailing relation in Europeans.

But in a small proportion, four specimens of Australian crania, in which some of the incisors had been preserved, it seemed as if the lower teeth had not projected so far forward as the upper, and that therefore they were overlapped by the latter, as in Europeans.

* I am indebted for the specimen to Mr. Samuel Hyam, student of medicine. † Presented by W. G. Howitt, Esq., Surgeon, Melbourne.

‡ Presented by Professor Anderson Stuart.

The question now arises, Can we give a satisfactory explanation of the peculiarity exhibited by so large a proportion of Australian crania? If we look at the configuration of the incisive region of the upper jaw in the Australian skull we find that it is much more prognathic, and the roots of the incisor teeth slope more obliquely downwards and forwards than in Europeans. On this ground, therefore, we might have expected to have found the upper teeth in Australians projecting to a greater extent in front of the lower incisors, than in Europeans; but this, as we have seen, is not the case. One should look, therefore, if, either in the development of the teeth, or in the form and growth of the lower jaw, or in the construction of the skull itself, anything has occurred to counteract the greater pragnathism of the upper jaw, and to bring the crowns of the lower incisors into a continuous curve with the upper teeth. I have already referred to the greater magnitude of the teeth in Australians, and have given comparative measurements which show that the dentary arcades in this race are both wider and longer than in Europeans. But whilst the absolute length is different, it does not seem as if the relative length of the upper and lower arcades to each other was much affected. For although the mean antero-posterior diameter of the lower true molars was longer than that of the upper by 2·8 mm. in the Australians, and by only 2·3 mm. in the Europeans, yet, when the corresponding diameter of both the premolar and molar teeth was measured, the preponderance in length of the lower over the upper series was the same, viz., 3 mm. in both sets of skulls. Hence one cannot say that the lower incisors and canines are pushed further forwards by the growth of the molar-premolar teeth in the one set of skulls more than in the other. Neither does there seem to be sufficient difference in the direction of the lower incisors in the Australians, when the jaws are closed, to bring them immediately below, rather than behind, the upper incisors.

As regards the form of the lower jaw itself, there does not appear to be such a modification in its shape as would cause its body to be projected forward so as to bring the lower incisors into the same plane as the upper. When the angle of the lower jaw does not approach a right angle, but is obtuse as in old persons, the body of the bone is projected forward beyond the vertical plane of the upper jaw. But in the Australian skulls, which possess the character that I am describing, the angle of the lower jaw is even more pronoun-

cedly rectangular than in the majority of adult European male crania. Moreover, the chin is not as a rule so prominent as in well-formed European skulls.

I have come, therefore, to the conclusion that the want of overlapping of the lower jaw by the upper in the incisor region is not due to a forward growth of the mandible, or its contained teeth, to an extent proportionately greater than that of the upper jaw, but that some other explanation is to be looked for.

If we examine the skulls of Mammalia which possess upper and lower incisors, we find that, as a rule, the cutting edges are in contact with each other when the jaws are closed. I may cite in illustration the Horse, the Carnivora, and Pinnipedia. In the Quadrumana also a similar character is seen, Anyone who examines the skulls of the Gorilla, Chimpanzee, and Orang, as well as those of tailed Apes, will see, if the teeth have not been lost, that the lower canine lies nearer the mesial plane than the upper, and that the incisors are in apposition by their cutting edges, which in old skulls are flattened from use. Associated with this relation of the incisor teeth is a prognathic condition of the upper jaw, much exceeding what is seen in any human skull.

The apposition of the upper and lower incisors in so many mammals seems therefore to be due to something more than a local cause affecting the jaws only. It is in all probability occasioned by a modification in the construction of the skull itself, which affects the relation of the face to the cranium proper.

Professor Cleland, in an important Memoir, "On the Variations of the Human Skull," directs attention to the smallness of the cranial curvature and the length of the base, as compared with that of the arch in the Chimpanzee and Orang when compared with the human skull, and he concludes his chapter on this subject as follows :—

"The advance in form of the human brain, as compared with the brains of the higher Apes, consists partly in an increase of cerebral curvature, dependent on depression of the sphenoid and ethmoid, and on descent of the orbital roofs towards the level of the ethmoid, but to a greater degree consists in increased expansion, both in height and breadth, of the cranial dilatation of the cerebro-spinal canal."

In a preceding chapter he had called attention to the fact that, in civilised people, while the length of the arch is very variable, the length of the base line is always great. He gives

the proportion of the arch to the base in the skulls of two Australians as 2·63 to 1, whilst the mean of nine Irish skulls is 2·89 to 1, and that of eight Germans is 2·80 to 1.

The Australian skulls measured by Cleland were too few to give the mean of the race, so that it was obviously advisable to make some additional observations on this matter.

In the tables of measurements which I have published in the "*Challenger*" *Reports* I have recorded the longitudinal arc of the cranium, the antero-posterior diameter of the foramen magnum and the basi-nasal diameter (basion to nasion) in a number of crania. Twenty male adult Australians were measured, and assuming the length of the foramen magnum + the basi-nasal diameter to give the base line, then the arch is to the base line as 2·72 to 1. The maximum base line was 150 mm. in two specimens; the minimum 128 mm.; whilst the mean of the series was 139·8 mm. The maximum longitudinal arch was 410 mm., the minimum 364 mm., and the mean of the series 380·4 mm. The great projection of the glabella in so many Australian crania would of course add materially to the length of this arch. The Narrinyeri skull (No 1), which is not included in the tables of measurements, had a base line 132 mm. in length and an arch 358 mm., the proportion being 2·7 to 1, which is a fraction below the mean of the twenty crania.

I have obtained similar measurements from a series of seventeen adult male crania of Lowland Scots obtained from known localities. In them the arch was to the base line as 2·80 to 1. In the skulls the maximum base line in one specimen was 140 mm.; the minimum was 127 mm.; whilst the mean of the series was 134·3. The maximum longitudinal arch was 397 mm., the minimum 361 mm., and the mean of the series was 376·5. The skulls of the Lowland Scots, notwithstanding their much greater capacity, had, as a rule, a shorter glabello-occipital diameter, for whilst the mean length of the seventeen Lowlanders was 185·7, that of the twenty Australians was 191·3.

These measurements, obtained from a larger series of specimens, support the statement made by Professor Cleland that the base line in the skulls of uncivilised people is long, whilst the proportion of arch to base line is less in the Australians than in Europeans.

It is difficult in the male Gorilla, on account of the size of the occipital and sagittal crests to determine in a skull which is not longitudinally bisected the arch of the cranial vault;

but there is no difficulty in taking the base line by the same method as in the human skulls above referred to. From a series of measurements of five adult male Gorilla skulls in the University museum, in which the tape included the occipital but not the sagittal crest, the proportion of arch to base line was as 1·9 to 1; in a young Gorilla in which the crests were not developed it was 1·6 to 1. In the crania of two Orangs, in which the basiscranial synchondrosis was not closed* the mean proportion of arch to base line was 1·6 to 1; whilst in the skulls of two adult Chimpanzees the mean was 1·7 to 1. It is obvious, therefore, that in the Anthropoid apes the base line is very long as compared with the longitudinal arch of the cranial vault. The absolute length of the base line was much greater in the adult male Gorilla than in the human crania, the mean in the five skulls being 163·8 mm., and even in the much smaller skull of the young gorilla it was 129 mm. The mean base line of the two young Orangs was 119·5 mm., and of the two adult Chimpanzees 120 mm.

The longer base line, when occurring along with an arch of shorter dimensions, is associated with a modification in the cranio-facial curvature; it effects the relation of the face to the cranium, and influences, I believe, the position of the upper jaw. With the shortening of the base line, the more horizontal direction of the ethmoido-cribriform plate, and the greater development of the curve of the cranial vault, especially in the frontal region the upper part of the face lies more immediately below the forehead, the longitudinal axis of the superior maxillæ approaches in direction to the vertical, the prognathic character of the upper jaw is diminished, the lower jaw slightly recedes, and the lower dentary becomes included so far within the upper that the upper incisors overlap the lower.

In conclusion, I would say that the relation of the upper to the lower incisor teeth, which I have found to prevail so frequently in the aboriginal Australians is also occasionally seen in the skulls of other races. Thus in the University collection a similar arrangement exists in a Bushman, a Malay, and an Esquimaux, but the number of specimens of these races with perfect sets of teeth is at present too small to enable me to draw a general conclusion from them.

* In one of these skulls all the permanent teeth had erupted; in the other, all, except the wisdoms, were in place.

British Journal of Dental Science.

LONDON, AUGUST 1st, 1891.

ADVERTISING.

“PRIVATE AND CONFIDENTIAL.”

“Dear Sir.

May I venture upon a suggestion, by the adoption of which, mutual advantage should result, viz :—that I shall be happy to allow you a commission of 20 per cent upon any fresh professional business that you may be the means of introducing to me, with 5 per cent. upon all renewals therefrom, and 5 per cent. upon any collateral introduction. My fees are as follows :—10s. 6d. for each operation, including stopping, extractions, &c., &c. Sets of teeth, 10 guineas, 15 guineas & 20 guineas. Servants and poor persons half fees.”

I am, dear sir,”

etc., etc.

So runs a notice, which has come into our hands. It seems to us, there may perfectly well be two opinions as to advertising, in an open and above board manner, but surely there can be only one, and that decidedly adverse to such a way of endeavouring to rake together patients. We do not know in the least what was the result of this miserable supplication and confession of being out of work, but certainly if a medical man has any claim at all to be looked upon as a professional man, he would promptly look on such a communication as a personal insult. We notice that the writer of this holds a hospital appointment, it would be curious to know whether the other members of the staff have had this brought to their knowledge, and if so, what notice they are going to take of it.

The question of advertising is a very large one. Every man must get known if he would gather around himself a practice ; he must advertise himself in every way that is legitimate : but it is around this point, what is, and what is not legitimate ; that the battle wages. We would not, of course, like to take upon ourselves the task of laying down the law, of drawing a hard and fast line which should divide that which is just, from that which is unjust, but still there are certain things which can be condemned without a second thought, there are others which the more high minded would not do, but which only raises an amused smile, when we hear of their being done ; there are, again, other matters concerning the correctness of which is so knotty a point that one's own views are apt to vary from day to day, as one's moods and fancies change.

Surely, there is nothing more amusing than to see a man endeavouring to get himself known, by writing on all sorts of subjects, to all sorts of papers ; notice how prominently the address is placed, how carefully the qualifications are attached, and what a lot is made of a little. Then again how eagerly some set to work to write a book, a collection of all that is old, but flavoured with nothing that is new. Here again notice the preface. The first personal pronouns almost elbow one another, so closely do they crowd, while to crown them all comes the signature with the flourish of an adept, likewise not forgetting to append the address. Success in life is to a large extent due to judicious advertising. Note how often a very third rate man does in the end become of some importance. The importance of this element of push in attaining success has been fully recognized, and must ever be regarded as perfectly legitimate. Quite different, however, are those obnoxious advertisements, which, but too frequently disfigure the public press, not to mention the dropping of pamphlets down the area. Perhaps if all that these advertisements state was strictly true, if the inducements offered were carried out, in the spirit as in the letter, one might even to some extent pardon these practices, alas !

we know only too well that they are not. Take the question of show cases. We suppose the work displayed in so hideous a manner is meant to be taken as that of the man who is waiting at the shop door to inveigle the unwary into his meshes. But is it? If so, what means the advertisement one finds sometimes as to "specimen cases" for sale. The fact is, such cases are often simply bought for the purpose of display, and is as much like the work which the advertiser supplies his patients with, as is a brick-bat like a Dutch cheese. Take again the question of advertising low fees as an inducement to patients to go to a particular man, does anyone pretend for a moment that these fees are adhered to? Is it not a matter of fact that every opportunity is taken, and excuse made for asking a higher fee? On the grounds of common honesty we ask, should not such advertisements be condemned?

But if we look at this question from the point of view of professional ethics, nothing but blame can attach to such advertising. We do not know what are the motives of such men, whether they have any pride in their work, any wish to be a member of an honourable profession, or any other ambition beyond the earning of a few pounds. We do not know what is the frame of mind which possess such men, whether if they were equally well paid, they would as soon be shoe-blacks, crossing-sweepers or perhaps sorters on a muck heap. There are some things one can never fathom, and we could never understand the man who ceases to take pride in his work, casts himself loose from all honourable associations, and proceeds simply to make what he can by fair means, or foul. It is an unsavoury matter one is glad to turn away from, and in charity hope that things are not always what they seem.

LITTLE things are often interesting and so the following letter which Mr. Jas. B. Bailey sends to the medical papers will be read with interest.

"SIRS,—As any details relating to John Hunter cannot be other than acceptable, I venture to think it will be of interest to your readers to know that I have just discovered a note by William Clift giving Hunter's exact height.

The note in question is in Clift's copy of "Hunter's Treatise on the Blood," which has just been purchased for the library of the Royal College of Surgeons. On p. 59, in a discription of Hunter's illness, it is stated that "objects were also smaller than the natural recollection of them ; his idea of his own size was that of only being four feet high." In the margin, opposite this Clift has written : " He was 5ft. 2in. in height." Again, on p. 65 the biographer states : " Mr. Hunter was of a short stature." Against this Clift has added a marginal note, " 5 feet 2 inches." There is no doubt from these entries that John Hunter was a shorter man than has hitherto been supposed. The biographers, however, point to the fact of this being a short man. Sir Everard Home, in the biographical notice prefixed to the " Treatise on the Blood " speaks of Hunter as " of a short stature," and Adams describes him as " below the middle stature." In his recently published *Echoes from the College of Surgeons* (*Hospital Gazette*, March 7th, 1891), Mr. T. M. Stone throws some light on this subject. Speaking of the drawing of Hunter by Sir Nathaniel Holland, he says that Sir John Doratt, a former pupil of Hunter, on being asked if the picture was a good likeness, replied "Yes, only it gives the idea of a large man, which Hunter was *not*, he was a little man." Jessie Foot describes Hunter as being " about the middle stature," and this description is copied exactly by Drewry Ottley. No doubt it is from this latter that the general idea of Hunter's size has been taken. It must not be forgotten that Home, Adams, Doratt, and Clift all had seen Hunter, and therefore spoke from personal knowledge. The figures in the margin of the book are in Clift's well-known neat handwriting, so that there is no possibility of mistaking them ; and the fact that the note occurs twice on different pages renders it very unlikely that Clift made a mistake in his entries."

Manipulative Miscellany.

All new instruments or articles that it is wished to have described under this heading, are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

THE MORRISON CHAIR.

WE have inspected, at the Dental Manufacturing Company's Depot, a new make of this chair, which they are placing on the market. The chief point about it is its low price. It appears to us to possess all the advantages which were offered by the Morrison that was sold at a higher price but a few years ago. It can be obtained either with upholstered or cane seats and backs, and we are told that the pedal lever can be attached to this as to the more expensive make of chair.

Abstracts of British & Foreign Journals.

THE FRENCH DENTAL JOURNALS.

DENTISTS AND THE LAW.

UNDER the above heading *L'Art Dentaire* publishes the following letter which has been addressed to *LE PROGRES MEDICAL*, by Dr. ISAMBARD, who opposed the new bill recently in the Chamber of Deputies.

To the Editor.

Dear Sir,—The profession of dentistry is free. Is it necessary to regulate it, and is it advisable to introduce such regulation in the law on the Practice of Medicine? The Chamber has said, YES! I said, NO! in an amendment which was the subject of only a brief discussion.

In place of being only a profession called liberal, medicine itself ought to be a free profession, if the freedom were not full of dangers on account of the social importance of medicine.

Dental science or dentistry, using the expression of M. Brouardel, has not that social importance which is the reason of the intervention of the State in the practice of medicine. Between the dentist and his client private interests alone are at stake. Because Dental Science borders on Medical Science, that is not a sufficient reason for regulating it when there are other professions which also are in touch with medicine, and which one does not dream, or which one no longer dreams, of regulating.

The motives which are assigned for regulating dentistry, or analogous motives, would also be assigned for regulating the profession of cook, nurse, masseur, bath proprietors, hair-dressers, barbers, and chiropodists. Formerly the corporations and communities of "barbiers-dentistes," and "chirurgiens-barbiers" lived under the protection of the ancient Faculty of Medicine. If the traditions of the College of Surgeons are revived in regard to dentists, why forget those which linked the profession of barbers to that of medicine. Ambrose Paré began life as a simple "chirurgien-barbier." The pilatory system has its anatomy, its physiology, and its pathology, as much as the dental system the care of the hair is as precious for women as that of the teeth. The hair-dressers are often the agents of transmission of contagious skin diseases. They make use of true medical preparations, epilatory pastes, pomades and tinctures which all represent one side of *materia medica*. Nobody, however, ever now dreams of giving to the "artist-in-hair" an official medical recognition.

Corns, which chiropodists treat, are an integral part of the surgery of the feet. These epidermal tumours are treated sometimes by local applications, sometimes by surgical operations. The extirpation of a corn may cause the opening of a bursa, or joint complication, or purulent injection. Are you going to regulate the profession of chiropody because chiropodists employ caustics, or make use of surgical instruments? And ought you not equally to compel them to prove before a jury that they know how to perform an autopsy, if occasion arise?

But it is said, dentists do other things besides pulling out

teeth. Without doubt they treat certain diseases of the mouth, for one of their Societies has assumed the high sounding title of the Society of Stomatology!! But what they do above all is dental prosthetics, and if to do this it is essential to have an acquaintance with practical anatomy, it is most useful above all things to be a mechanic. Dental prosthetics have made great progress during this century, and without being unjust to these dentists who are medical men, we may safely say that the true authors of this progress have been the unqualified dentists. And if we compel these mechanicians of dental prosthetics to undergo medical examinations, why not also impose an official diploma on makers of artificial limbs and trusses. These callings have close relationship with medicine and surgery. Is that a reason for regulating them?

The great argument that is used for compelling dentists to undergo special examinations is that they practise anæsthetics, and that this practice must either be made legal or illegal. The Commission in exacting from them these special examinations, nevertheless refused them the right of practising anæsthetics alone. This either forbade the use of anæsthetics altogether, or rendered it very expressive. Painless operations remained the privilege of those who could afford the luxury of the presence and services of a medical man. Pain was reserved for the poor. I maintain that this is hardly acting up to democratic principles. Either the special examination of dentists signifies something, and ought to prove that these operators are capable of practising anæsthetics alone, or else the examinations have no signification, and there is no object in regulating the profession.

To sum up. The liberty which the dental profession has enjoyed has been favourable to the progress of dental science, and inasmuch as no social interests necessitates the regulation of this profession, Parliament has no business to include it under a law on the practice of medicine.

Accept &c., &c.,

ED. ISAMBARD,

Deputé de L'Eure.

We make no apology for printing this letter *in extenso*, for inasmuch as it is written by a doctor, and a member of the French Parliament, whose sentiments are applauded by many, and even apparently by the majority of the French dentists themselves, it shows our readers pretty clearly the

light in which dentistry is held by at least a section of the educated and enlightened *public of France*.

Both *L'Art Dentaire* and *Le Progres Dentaire* publish articles on the new local anæsthetic Chloride of Ethyl. In the former M. Preterre gives his experience. He has tried it both externally along the course of the inferior dental nerve in the lower, and in front of the ear for upper teeth, and internally on the gum itself. The external method has not yielded uniformly satisfactory results, but the internal method has given every satisfaction, the patients declaring that they have not felt any pain, except for the disagreeable sensation due to the freezing of the gum, and this according to Dr. Heinrich, of Frankfort, can be avoided by rubbing the gum beforehand with a solution of cocaine. M. Preterre says that in every case it is advisable to put oil or glycerine on the part of the gum operated upon.

Le Progres Dentaire goes very fully into the chemistry of the subject, and details some experiments which go to prove that its anæsthetic action is due entirely to its refrigerating properties, and not in any appreciable degree to absorption of the drug into the circulation. The method employed in all cases was spraying from the tubes supplied by the firm Monnet et Gillard, of Lyons, and the conclusion arrived at is that in nearly every case it produces complete anæsthesia, which comes on in about one minute, and lasts some time.

ON THE RELATIVE ADVANTAGES OF A LOW FUSING CONTINUOUS GUM.

By GEO. CUNNINGHAM, M.A. (Cantab.), D.M.D. (Harvard).
L.D.S. (Eng.) Cambridge.

Mr. President and Gentlemen,

It is not without some feelings of trepidation that I submit to such a distinguished audience of American Dentists as the Illinois State Dental Society, which includes amongst its members specialists whose artistic productions in continuous gum have procured for them repute of more than local character, the results of my endeavours to simplify a

process which has excited the admiration, if not the aspirations of almost all of us at one part or another of our professional careers.

I would especially claim unprejudiced criticism at the hands of the specialists, since I make no claim that the results of the new process are superior to continuous gum work as executed at present by the expert ; indeed I would be more than satisfied if in time the practical results should prove as good.

Every dentist will admit that the nearest approach to a perfect substitute for the natural teeth is a well made and properly adapted and artificial denture of enamelled platinum.

It is a sufficiently curious fact that the most artistic achievements of the mechanical laboratory, which has made the honoured name of John Allen one of world-wide celebrity, is as far from being a part of the every day practice of the ordinary dental laboratory as it was on its introduction some forty years ago. This result does not arise, at any rate, entirely, from any lack of artistic aspirations within the dental profession, since the sectional gum blocks of the American and the improved pink rubbers of the European manufacture may be regarded as efforts to meet the not yet wholly satisfied feelings of the dental mechanician.

The artistic production of a generation of experts have proved that continuous gum work has not failed to be more generally adopted by the profession, from any intrinsic failings of its own, but rather from the extrinsic difficulties incidental to its production. These difficulties may be summed up under three heads.

1. Teeth ; 2, Material ; 3, Firing.

1. Teeth.—It must be a decided drawback to a process when, as in ordinary continuous gum special teeth are requisite for the process, unless these are also applicable to the commoner methods of the dental laboratory. Relatively few dentists seem to have been alive to the fact that continuous gum teeth are capable of being mounted into a vulcanite denture with more artistic effect than the ordinary flat rubber teeth. As a matter of fact, a proper selection as to shape, size and colour is not found in the average dental laboratory, nor even in the most important dental depots, at any rate on this side of the Atlantic. It is surely obvious, therefore, that the process would be more generally employed if it were capable of being applied to the ordinary kinds of teeth, of

which a fair if not adequate selection is to be found in the laboratory of most dentists and certainly in most dental depots.

2. Materials.—While no complaint, I think, can be advanced as to the quality of the gum body, I know that my own experience as to the frequent defects of the gum enamels, is corroborated by others. One of two cases successfully carried to the biscuiting stage, and then turning out a muddy brown or exceedingly crazed, are sufficient to extinguish forever the ardour of the occasional continuous gum worker.

A further difficulty with regard to materials is that of obtaining specific varieties of gum colour with anything like reasonable certainty.

3. Firing.—If one may judge from the recent efforts to remove it, the greatest difficulty of all in the ordinary form of continuous gum work, has been the labour involved in the prolonged furnace work, a difficulty, however, which is very much greater to the occasional employer of the method than to the specialist.

Almost all the recent endeavours to extend the use of continuous gum work have been directed to the simplification of the furnace work, mainly, by the employment of gas in place of coal as a fuel. Verrier, Land, Parker, Stoddart, and more recently Ash, have done very much to extend the use of continuous gum work by their efforts to reduce the labour involved in firing with the coke furnace.

Despite the contention to the contrary by specialists, practical experience justifies me in maintaining that excellent continuous gum work may be done in a mixed gas and air furnace such as Verrier's.

Recently Messrs. Ash & Son have introduced an excellent continuous gum furnace to be used either with coal, gas and air supplied by a foot-blower, or for coal gas and compressed oxygen.

It is probable, however, that where a large amount of work has to be done, none of these appliances can replace the ordinary coke furnace. It is evident, therefore, that any reduction of the time and labour involved in the process of firing would be a distinct advantage. By directing my efforts to procure a tangible reduction of the vitrification point of the materials employed, I have found a new point of departure, which simplifies the process of continuous gum work, by removing the difficulties, not under one, but under all the three divisions mentioned.

This statement is far from comprehending all the difficulties or disadvantages which have been ascribed to the working of continuous gum, but if this summary is taken as a fair representation of the main difficulties, I shall ask your consideration, under the same heads, of the modifications possible and contrasting the relative advantages of a low, as compared with the high fusing continuous gum.

1. Teeth.—It is at once evident that with a low fusing continuous gum, instead of special teeth being required, all teeth, plate, or vulcanite, English or American, are applicable.

It is impossible to over estimate the magnitude of such a change, since in every well equipped dental laboratory will be found a fairly adequate selection of teeth for ordinary cases, except perhaps where the greater resources of a dental depot are actually "next door." Further facilities of adaptation will be found in the possibility of utilising for special cases, the old wooden pivot teeth, and the modern porcelain crowns. The extraordinary rise in the price of platinum is certain to give a fresh impetus to the manufacture of teeth without platinum pins; some indeed, have already appeared on the market, and have been found quite suitable to the method of continuous gum.

What is known as tube teeth work, is not much known in America, but I venture to say that those American practitioners who have seen well executed samples of this kind of work will understand the predilections in its favour of the older practitioners in England.

Tube teeth in contradistinction to flat teeth may be described as somewhat conventional reproductions of the natural tooth forms with platinum tubes occupying the longitudinal and central axis of the crown. Tube teeth are especially applicable in cases where the teeth are required to fit the gum, and some the plate, or where all fit the plate, the latter being only applicable where the patient is not likely to show more than the crowns of the teeth.

The plates having been struck up and the teeth roughly fitted down, the places for the pins are ascertained by passing the wire tipped with vermilion down each tube, the teeth are thus removed from the plate, the holes carefully drilled at the points marked.

Appropriate lengths of gold wire (pin size) accurately corresponding to the tubes in the teeth are soldered in these holes. After this has been done, and the pins ascertained to

be perfectly placed, they are fitted to the bite, the teeth are then "fine fitted" with the plate, and finally the crowns are ground to a perfect articulation with their antagonists.

The tubes having been thoroughly cleansed and the pins on the plate roughened, the teeth are finally cemented to the plate by means of powdered brimstone, melted and flowed between the tube and the pin. On cooling, the teeth will be found to be thoroughly secured.

The process of "fine fitting" occupies even in the hands of the expert the major part of the time of manufacture of a tube tooth case.

By making the plate and pins in platinum instead of gold and applying the low fusing continuous gum, no "fine fitting" of the tooth is necessary, except where the teeth impinge directly upon the gum. The general excellence of ordinary tube work is further improved by the filling up of all the spaces where the food might lodge, without impairing in any way the utility and strength of the older method. While in those cases where the gum is much absorbed, the addition of the gum enamel is a great advance on the often unsightly long rooted tube teeth.

I have worn a partial lower case (lower bicuspid and molars on each side) for about a year with perfect satisfaction. From my own experience and from several other practical cases, I am confident as to the practical results of the new method, when applied to tube teeth work.

If the process were at all generally adopted it would probably be followed by the introduction of a new and improved form of tube teeth without the platinum tube, which is rather a disadvantage than otherwise for our purpose, or by a solid crown with a simple slot on its palatal surface, the slot to fit on tiny hold-fasts of sheet metal soldered to the plate, thus somewhat simplifying the delicate process of mounting the pins for tube teeth.

It often occurs that one has a tooth of the requisite size and form, but altogether inadequate in colour for the required case, my present line of experiments is being largely directed to producing a series of vitrifiable tooth colours by which one will be able to modify the colouring of any tooth to suit the requirements of a special case. The initial experiments have been quite successful, but it will be some time before I shall be able to produce all the varieties of colouring necessary for this purpose. Such an adjunct to the resources of the

laboratory would not only tend to increase the use of continuous gum, but it would be of great utility in ordinary cases of plate and vulcanite work.

2. Materials.—An investigation of the formulæ of the ordinary continuous gum body and enamels shows that they consist of ingredients of very different degrees of fusibility, and such substances as cryolite, Bohemian glass, flint glass, "white glass" (whatever that may mean) are evidently added for the purpose of reducing the fusibility of, or acting as a cement to, the refractory ingredients.

A prolonged series of experiments, which it would be tedious to detail, resulted in the production of a body, and enamel which if properly manipulated is of sufficient strength and durability, at least as far as my present experience goes.

In my latter experiments I have had the great advantage of the co-operation of Mr. H. J. Powell who is one of our greatest scientific authorities on the subject.

By utilizing a formula of the mosaic work for which the well-known White Friars Glass Works, London, are celebrated, we have succeeded in producing gum enamels which are not only capable of infusing the relatively low temperature, but giving what I trust you will regard as sufficiently artistic results.

I think that you will admit that, just as we match teeth it would be almost as easy to match the natural gum, which in different mouths presents an extraordinary variety of shades and appearances from the pale anæmic gum to that purplish turgidity not unfrequently found to be chronic in many mouths.

After having referred to the extreme fusibility of the new enamel you will doubtless be surprised that the specimens presented to you are mounted on a highly infusible base. The new method may be fused on copper, dental alloy, and gold, but it was early discovered that there was so far only one material, namely, platinum, which was available, and that for two reasons.

(1). During heating, chemical change takes place between one or more ingredients of the enamel and metallic base, so that only recently I have been able to obtain a natural gum colour, or any other metallic base, but platinum and pure gold.

Experiments as to the adhesion of this vitreous enamel on

various metallic bases afforded a reasonable clue as to the cause of the change of colour.

(a) On pure gold there was no discolouration.

(b) On silver there is a yellow discolouration.

(c) On copper there is a black or greenish discolouration.

These facts seem to indicate, first, an oxidizing of the metal under the influence of heat, and second, the metallic oxide thus formed, imparting its colour to the vitreous enamel, either directly or by causing some further chemical change in the constituents of the vitreous enamel.

In my earlier experiments on 18 carat gold, we obtained so much discolouration as seemingly to preclude its use in this method. Latterly, I have been able to obtain fairly satisfactory colours on 18 carat gold, but have so far been unable to find a solder which could be used without discolouration of the enamel.

(2). The co-efficient of expansion of platinum and glass being the same, platinum must possess obvious practical advantages, especially as to adhesion, over any other material.

If it is desired to give the denture the more acceptable appearance of gold, it is easy to do so either by electro-gilding, or better, by employing a plate which has been rolled out from platinum with pure gold sweated on its surfaces.

The co-efficient of expansion of gold although differing from that of glass does not seem sufficiently removed as to utterly preclude its employment. Like the older methods the new material is lacking in elasticity, and, therefore, it is only of sufficient strength when there is a sufficient thickness of the material, and the plate is rigid, it is better, therefore, to form a boundary, or limit, for the material by turning up the edge of the plate, or better by soldering the rim of triangular or square wire not only around the buccal margin, but also on the palatal aspect of the plate.

In filling upper cases, it is of little practical advantage to cover the plate with either gum body or enamel as that only serves to increase the thickness of the plate and increases the prospect of future reparation.

With regard to the variety of shades of gum tints, experience has shown that a gum enamel containing exactly the same metallic oxides, as colouring materials may be made to give quite a variety of tints by the state of subdivision.

Thus, if the enamel is somewhat too bright, it may be reduced by slight mulling on a glass slab, but if it is too finely

mulled the colour becomes very much lighter, but also more opaque, which is, of course, a decided disadvantage. From the four samples sent, representing two grades of the normal arterial and venous tints, four other distinct clear gum colours may be produced by slight mulling, and by making them in different proportions still further tints may be produced. Other grades can be added as occasion may demand.

(3). Firing.—With regard to this process I have had considerable difficulties, as no existing form of furnace was found exactly applicable to the nature of the work, and the dimensions of the ordinary denture.

By increasing the aperture of Fletcher's muffle furnace No. 261, made for other purposes, I was enabled to adapt a muffle of a sufficient size. An ordinary fire-clay muffle has now replaced the platinum one which I used until recently. I have also used a similar shaped cast iron muffle with perfect success. This has the advantage of being unbreakable, but the disadvantage of requiring frequent whitewashing, and heating several times before it can be employed with satisfaction.

I am now waiting for a new furnace which Mr. Fletcher is making for me. It will be extremely simple. There will be no muffle, but the firing will be done simply by time in an inner chamber, most probably over an ordinary bunsen burner. The bunsen used with the furnace I am at present using is an ordinary draft gas and air burner requiring no blowing, only good draft and a full gas supply. The firing may be accomplished in about twenty minutes, or at the utmost half an hour, starting all cold. It is a distinct advantage to anneal the plate by slow cooling. This is the best effected by turning the gas down slightly and retaining it several hours at a temperature somewhat less than the firing heat, and then gradually allowing it to cool down in the oven during the night. On turning out the gas, closing the chimney retards the process of cooling very materially by preventing any draft of cold air through the furnace. The longer the piece is in cooling the less likely will be the appearance of cracks, for although these are frequently invisible to the naked eye, they are almost always present. I have had, however, very fair practical results without retaining it at the low temperature.

Mr. S. J. Hutchinson, the president of the Odontological Society of Great Britain, in his recent inaugural address, when enumerating the many problems in dentistry which yet remain to be solved, and thus afford ample scope for further research,

concluded as follows: "In the workroom we cannot find out a substance possessing the beauty of so-called continuous gum which shall be as easily worked as vulcanite."

Far be it from me to pretend that by this process I have solved this problem, but from my own experience, as well as that of my assistants, working in a laboratory with only experimental equipment, I feel convinced that this new process is a tangible contribution toward that ideal.

My present purpose, however, is sufficiently attained if this description of the process and the specimens* illustrating it have interested you; for I have long felt that I owed the members of the Illinois State Dental Society some practical token of my existence as a corresponding member and a substantial expression of my thanks for the honour conferred.

The Dental Review.

CEMENTS FOR THE TEETH.

At a meeting of the New York Odontological Society, the following paper, entitled "A Contribution to the Knowledge of Cements," by Dr. William Herbert Rollins, Boston, Massachusetts, was read:

Since 1872 I have tried to find a cement for filling teeth. To avoid less in rediscovery I have analyzed the cement in market, finding them oxychlorides of zinc. It has been amusing to see each new cement praised while old ones like it were given up. I have analyzed two cements which have been placed in the market. Their resemblance may possibly show another case of independant discovery in different countries.

ANALYSIS.

<i>Fletcher's.</i>		<i>Weston's.</i>	
Fluid.	Solid.	Fluid.	Solid.
Phosphoric acid.	Basic oxide of zinc.	Phosphoric acid.	Basic oxide of zinc.
Phosphate of alumina.			80 per cent.
			Silicite of alumina.
			80 per cent.

The silicite of alumina in Weston's cement is inert. The two cements are less irritant than the oxychloride of zinc. They adhere firmly to the tooth. They will not last. Orists

* The specimens were invariably detained at the Custom House, New York. They will be exhibited at the meeting in Springfield, May, 1892.

will find them cheap and easy to make, a pound not costing more than is paid for an ounce. If you buy phosphoric acid, test it. Twenty per cent of sodium is often found in the glacial.

Directions for making a phosphate cement: Concentrate pure phosphoric acid till semi-solid; mix aluminum phosphate with it by heating. For use mix with basic oxide of zinc to the consistency of putty. The light oxide of zinc should not be used here, nor in making ozochlorides. The cement sets in two minutes.

Phosphate cements are not new. See patent No. 159,568, February 9, 1875. As the Patent Office rules that the first inventor may claim a principle broadly, I do not think these cements of Fletcher and Weston can be patented in America.

This patent could probably be bought, for the inventor seems not to have brought his cement into the market.

In covering thin dentine over a pulp we have needed a non-irritant, strong cement, which, though mixed thin, would harden quickly.

By calcining magnesium nitrate an oxide is made. This when hydrated, forms a durable cement. When mixed with phosphoric acid hardens at once, growing so hot as to burn the hand. As basic oxide of zinc forms with phosphoric acid a slow-setting cement, the indication is plain. I have used for pulp-capping and temporary filling the following mixture:

Basic oxide of zinc.....2 parts.

Oxide of magnesium..... 5 “

Grind them together. For use, mixed to a paste with sirupy phosphoric acid. This sets in thirty seconds. I still believe the future filling will be a cement; these are but transitory.—*Scientific American*.

THE PRACTICE OF DENTISTRY.

It is still uncertain how far mere dental studies, as a specialty will advance our knowledge of the deeper causes of disease of the teeth. Recent views as to the chemico-parastic organ of caries are very suggestive, and likely to be very fruitful. But the most complete study of the micro-organisms affecting the teeth we owe to men who are members of the medical profession as well as mere dentists, and who take a broad view of the

subject. The constitutional and diathetic aspect of tooth disease are very important, and are likely to be appreciated only by those whose function it is to take them into consideration. Dentists differ from all other recognised specialists in that they are not necessarily members of the medical profession. What should we think of an ophthalmic surgeon or a gynæcologist who was not fully qualified in all branches of the profession, and who did not view the eye and the uterus in their wide relations to other organs and parts? This is a defect in the position of the dentists which has many bearings, and which should be removed by all who can afford the time and money to make their medical education complete. The public and the profession must always prefer the dentist who can apply general considerations to the teeth, and can bring them into use to restrain or guide his hand in the surgery of those organs over which he has now such despotic sway. The wholesale extraction of teeth and their substitution of artificial ones is now one of the most anomalous proceedings in any art, and sadly needs the vindication of a larger and professional judgment. While, however, we point out defects in the position and curriculum of dentists as at present defined, we have cheerfully to recognise that in their Associations they are endeavouring to reduce to a minimum the objections that arise from their highly specialised education, as well as the evils incidental to their being a number of men on the Register with a tendency to use trade methods of success rather than professional ones. We wish the Association all success.

We maybe permitted one word of caution in which to regard the extension of what is called the character of dentistry. It may well be that the poor have need of much of the dental relief for which the rich are ready to pay such high prices. But there is need of caution. Some of the dental journals published with a note of satisfaction the increasing numbers who get relief gratuitously at dental hospitals. The *New York Medical Record* of June 27th, devotes an article to the use and abuse of dental charity. The abuse in the States is beginning to alarm the members of the dental profession. One very questionable remedy is being applied in one of the dental hospitals—viz., to make charges a little higher than those ordinarily made in hospitals. It is enough now to indicate the evil to put our readers and the authorities of dental hospitals on their guard. The phenomenon of the wholesale barbarous extractions of peripatetic

quacks" is very strange one. Perhaps the strongest part of it is the willingness of the victims to submit to this mutilation simply because they can have it done for nothing.

The Editorial in Lancet.

ELECTRICITY FOR DENTAL PURPOSES.

By DR. T. L. GILMER.

I want to say a word with regard to electricity for the purpose of operating the dental engine. I have had six years' experience with the use of the water motor, and it certainly answers a very good purpose where there is a sufficient water pressure at all times. Since I have been practising in Chicago where the water pressure is not always sufficient, I have investigated electricity somewhat, and find it more satisfactory than water. With it there are no valves to leak, perhaps there may be less trouble of this kind with the Teurk motor, but with the Backus motor I had leaks that caused me considerable annoyance. Then there is the danger of the freezing of the water in the pipes. The method I employ in the manufacture of electricity can be used anywhere, therefore its use is not confined to large cities only, where there is a day current. I use a storage battery such as I showed you last year. The storage battery may be sent out to be charged by the dynamo, or it may be charged by primary cells, but I will not say very much more about that for fear of trespassing upon the report of the Committee on Dental Science and Literature. Regarding the electric motor, I think there is no make, speaking from my experience (and I have examined a number) better adapted to the dentists' use than the $\frac{1}{8}$ horse power motor made by the C. & C. Co. It is certainly well adapted to our use, especially their reversible motor. Frequently it is desirable to reverse the direction of the rotation of a tool, this may be done with this and other makes of electric motors, but cannot be done with the water motor. My motor sets on my operating case in easy reach and when I desire to change the direction of rotation I simply throw the lever over from the one side to the other. This changes the brushes and alternates the current reversing the direction of rotation. I do not think Dr. Ames used the Suspension Engine sufficiently

long to fully appreciate all its good qualities or he would not have given it up. It seems to me we wish to apply the power as directly as possible to the bur. In using large discs or corundum points, or even large burs, with the flexible cable engines, where they are applied with some force, the tool appears to be rotating in both directions, indicating a good deal of back lash. This is something we wish to get rid of, and it cannot be gotten rid of if we use the flexible cable. I have used the suspension engine for a good many years and do not think I could be persuaded to change to any other, unless constructed on the same principle: however, it needs some improvements in the pullies and cord attachments.

The cost for dentist's use for the street current is 3.00 dols. per month. The price of sulphate of copper varies, when it can be bought for 8c or 9c a pound, this with the zincs, which must be replaced in the primary batteries once every four or five months, make a total cost for a full practice of about the same. Regarding the life of a storage battery I cannot speak definitely. Of course a great deal depends upon the use it has. Some have been in use for three or four years and are still in good condition. For light polishing, such as for crown and bridge work and for propelling the engine, two storage cells will be sufficient. There are a good many uses to which the electric current may be put other than running the motor.

I do not see how I could well get along without a light for the mouth. Sometimes I wish to see into the roots of teeth in which I cannot easily reflect daylight. Late in the afternoon or on dark days an electric light may be very usefully employed. By reflecting the light from one of the small Edison lamps into the roots of teeth, in some cases I can see better than when daylight is used. I do not feel that I can treat a root so thoroughly without the aid of electricity as with it. Sometimes we find a cavity neglected in which there is a large fungous growth of gum which has nearly filled the cavity. This growth may be removed with certain kinds of excavators, but is much more easily removed by the galvano cautery. After its use there is no bleeding and the parts are left in a healthy condition.

Again, we find a wisdom tooth which has perhaps been periodically troubling the patient for several years in an endeavour to erupt, in which it has perhaps been only partially successful, there is a heavy layer of gum over the posterior surface. We have scissors and forceps made for the pur-

pose of cutting away this gum, but with them at best it is a bloody and awkward operation. Bend the wire of the cautery so as to adapt it to the case, apply it, and turn on the current ; it removes the gum quickly, besides it is antiseptically done.

Dental Review.

Review.

Harris' Dictionary of Dentistry. Fifth Edition. Published by BLAKISTON, SON & Co., of Philadelphia, and by ASH & SONS of London.

THE fifth edition of this work has been edited, like the third and the fourth, by Ferdinand Gorgas, Professor of Prosthetic Dentistry, in the University of Maryland. The editor claims in this edition, to have rendered the work more purely Dental, but at the same time, it is certainly something more than a dictionary of terms used in dentistry, for it includes as well terms used in medicine and surgery, which have little or no connection with dental matters. This is, in a sense, an advantage, for it supplies the dentist with one work of reference which will serve him on all occasions. The dental terms are, however, treated at much greater length than are the others, and in some cases these articles can be read with interest and advantage. Some of these, we are sorry to say, strike one as hardly up to date, and certainly read as if they were not written by an expert. Take that on Fractures of the Maxillary Bones. We find recommended as the treatment for simple fractures the old-fashioned, dirty and cumbersome method of "the four-tailed bandage, or paste-board, or gutta-percha splints." It reads as if these were three different lines of treatment, would not these splints be combined with the bandage? Surely every dentist would treat such with an interdental wire splint, the Hammond's, but of this there is no mention. Under "saliva-pump" we look in vain for the principles on which it is designed, eight lines are devoted to saying that which is already said by the two words saliva, pump. The definition of ivory as "the tusk of the male elephant" is surely peculiar, it would be as correct to define dentine as a tooth. These are a few points we noticed in glancing through the work which leads us to the opinion that though the work is a valuable acquisition, there is still room for the development of its more purely dental side.

Dental News.

PRIZE DISTRIBUTION OF THE LONDON SCHOOL OF DENTAL SURGERY.

ON Wednesday, July 22nd., the Annual Conversazione and Prize day of the London School of Dental Surgery was held in the Royal Institute Galleries, Prince's Hall Piccadilly. The evening was a very pleasant one, and a considerable number of ladies and gentlemen gathered at the invitation of the Dean and the members of the Staff. The Ven. Archdeacon Farrar, D.D., F.R.S., distributed the prizes to the successful students of the year, and gave them an eloquent address. Mr. Morton Smale, the Dean, introduced the prizemen and presented his annual report. It is customary on these occasions for the Dean to make a report with regard to the School, and the year which comes to an end at the close of the summer session has been a peculiarly eventful one. With an entry of about fifty students, very great demands have been made both upon the capacity of the building and the teaching power of the institution, so much so that it had been found necessary to increase both, inasmuch as it has been decided that it is undesirable to build a new hospital upon an increased area, and that it is impossible to increase the depth of the present one, it has been found necessary to provide more opportunities for both practice and teaching, by opening the Hospital in the afternoons, under the care of a special staff to superintend the work. The hospital has been fortunate in securing the services of gentlemen to constitute the afternoon staff, who are not only likely to add materially to the teaching power, but also likely to reflect credit upon the hospital. This, however, can only be a temporary measure to meet the demands made upon the school, for each year dentistry is earning for itself the right to be ranked amongst the learned professions, this must necessarily attract, a larger number of young men as students, when it becomes recognized, as it soon must, that the practice of the Profession of dentistry is an honourable one, and its members are, both professionally and socially, on an equality with all the other professions, and that of all of them there is none which provides a better opening for a useful and honourable means of

livelihood. Its students also, by the curriculum and examination required of them, are in all respects on an equality with the students of other professions, while of the examination it may be said that in no calling in life are the tests to which the Candidates for the Dental Licence are put equalled or surpassed to obtain a qualification to practice.

It may be true that charlatanism and quackery press somewhat more hardly upon those who desire to practise their profession honourably than they do upon kindred professions; and those of you who shortly are to begin the struggle of existence, may take courage from the fact that the most inveterate advertising Institute, in a pamphlet that it circulates, apologizes for advertising, and promises to cease doing so as soon as the credulous public have fully recognized its miraculous, and ridiculous claims, a fact that points out very clearly that its promoters recognise that the public are beginning to understand, that for professional men to advertise is, "*infra dig*" but as the position of our calling has, but I venture to think not more severely, been earned in the past by the consistent and persistent doing of right of those interested in its welfare; so must it be maintained in the future by you and your successors. It is in your hands, for henceforth nobody can obtain the right to call himself a dentist, unless he be qualified, and if every unit will do right, then shall the whole profession obtain its due professional position. The school, ever anxious for the welfare of those entrusted to it, and looking forward to the bright, I had almost said brilliant, future, has arranged with the committee of management that the two societies that in the past have had their headquarters at the hospital, shall shortly vacate their quarters in order that the whole of the building shall be devoted to hospital purposes, and even then it may be found necessary to take adjoining premises for school purposes, in which duly fitted up laboratories may be erected for dental microscopy, bacteriological research, and kindred subjects. The staff is quite determined to meet the demands that may be made upon it in the future.

The Odontological Society, and the Dental Hospital of London, are so closely interwoven, that it is not without a pang that a life long union is to be ruptured but in as much as both have so developed, it is better for both, that each should have head quarters worthy of them, and of each it may be prognosticated, that benefit, and not harm, will accrue.

In order that the teaching may be more thorough, four demonstrators have been appointed, each of whom will give theoretical and practical teaching upon operative dentistry, the gentlemen appointed being Messrs. Briault, A. Colyer, W. H. Dolamore, and J. P. Smith.

The Mechanical laboratory continues to be a great success, and enables the students to prepare for the practical test required by the Examining Board for the Dental Licence, of which practical examination, it may be said, there will be no decrease in severity.

Five of our students have added to the prestige of the school by obtaining the double qualification of M.R.C.S., and L.R.C.P. — viz., Messrs. Hoffmann, Constant, Arthur Colyer, Hope, and G. Hern, the latter having succeeded in securing the three qualifications in three years and nine months, and in addition has ably filled the post of assistant and full house surgeon. The Charing-cross Hospital prize list is again well sprinkled with the names of our students, eight first prizes and a gold medal having been won by dental students, of this, your staff are justly proud, and look forward to even greater success in the future.

Through all the history of your Hospital and School, one word has been its watch word, let each one of you for the future adopt it as your motto. Thoroughness, at all times it has been so, let it be still and even the brilliant history of the past, may yet be surpassed by you and your successors.

The following were the Prize winners:—

Saunders Scholar Mr. R. N. Gracey.

Ashs' Prize (*Given by Messrs. Ash & Sons*) Mr. E. Balding.

Certificates Mr. B. A. Castellote & Mr. S. H. Hayward.

Class Prizes, Winter Session, 1890-91.

Mechanical Dentistry.

First Prize Mr. C. J. Allen.

Second Prize Mr. E. Balding.

Certificates Mr. F. T. Ladmore, & Mr. A. P. Spurr.

Metallurgy.

First Prize Mr. T. A. Coysh.

Second Prize Mr. R. N. Gracey.

Prize in Operating Dental Surgery.

First Prize Mr. E. Gardner.

Second Prize Mr. T. A. Coysh.

Certificate Mr. E. Balding.

*Class Prizes Summer Session, 1891.**Dental Surgery.*

First Prize	.	.	.	Mr. R. N. Gracey.
Second Prize	.	.	.	Mr. A. P. Spurr.
Certificates	Mr. S. H. Hayward, Mr. E. Balding, Mr. F. T. Trott, Mr. C. S. Reed, Mr. E. W. Harwood.			

Dental Anatomy

First Prize	.	.	.	Mr. R. N. Gracey.
Second Prize	.	.	.	Mr. S. H. Hayward.
Certificates	Mr. E. W. Harwood, Mr. C. H. Watson, Mr. E. Balding, Mr. F. T. Ladmore, Mr. B. A. Castellote.			

Students' Society Prize	.	.	Mr. A. C. Gask.
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After the presentations had been made, the guests wandered about inspecting the portraits which are now being exhibited in the galleries, or they listened to the phonograph, or the selection of music by the Hospital Medical Society, or to the new musical sketch "In Search of an Engagement," which was artistically given by Miss Nellie Gauthomy. Whilst last, but certainly not least, they made free with the admirable refreshments which were provided.

ROYAL COLLEGE OF SURGEONS IN IRELAND DENTAL EXAMINATION.

MR. VINCENT DOYLE having passed the necessary Examinations, has been granted the Diploma in Dental Surgery of the College. The next examination is fixed for October 26.

THE ANNUAL PICNIC of the past and present Students of the Victoria Dental Hospital, of Manchester, took place on Thursday, July 23rd. The party left the Exchange station at 9.40 a.m. for Chester. The weather was at first very unfavourable, but after partaking of lunch, the afternoon turned out bright and sunny. The party then proceeded down the river Dee by steam launch, as far as Eccleston

Ferry, viewing Eaton Hall, and having a pleasant ramble through the grounds, etc. A capital dinner was provided at the "Bull and Stirrup." Amongst those partaking of dinner were Mr. W. Simms, L.D.S.; Mr. F. W. Minshull, L.D.S.; Mr. H. Minshull; Mr. D. Headridge, L.D.S., and Mr. W. Birkett, L.D.S. After dinner, boating on the river Dee was indulged in, and a most enjoyable day was brought to a conclusion by songs, recitations, etc., in the cosy parlour of the "Bull and Stirrup." The arrangements were carried out by a Committee, of which Mr. W. Birkett, L.D.S., was Chairman, Mr. J. C. Lingford, Secretary, and Mr. J. C. Stokoe, Treasurer.

OBITUARY.

THE death of Dr. James W. White, (Editor of the *Cosmos*), to which we have already referred in a former issue, seems to have come unexpectedly. He had been engaged in his usual work the day before, and it was whilst dressing in the morning that he fell forward, dying almost instantly. Dr. White had been associated with his brother Samuel in the firm S. S. White & Co., from its earliest days, and had lived to see and help in the growth of this business to its present large proportions. Since the death of his brother and the formation of the firm into a company, he had continued to be its head. From his earliest days he was intimately associated with the supervision of the *Cosmos*, and for many years was its Editor. Dr. White was not only a keen man of business, and a graceful writer, but he had large sympathies with many works of a philanthropic nature. No single man is long missed in this world, but Dr. White will certainly linger in the memory of his friends and associates after many another is forgotten.

VACANCY.

Dental Hospital of London, Leicester Square, W.C. The posts of Anæsthetist and Assistant Anæsthetist are vacant. Applications with testimonials to be sent to the Secretary.

Dental Hospital Reports.

MONTHLY STATEMENT of operations during June, 1891.

	London.	Manchester.
Patients		1037
Extractions	1611	568
„ under Anæsthetics	1001	110
Gold Fillings	548	43
Other Fillings	1398	205
Irregularities	210	54
Miscellaneous	433	231
Artificial Crowns	31	5
Total		1216
<i>House Surgeons</i> G. HERN, ERNEST PARSONS, J. PERCY OLIVER.		W.R BIRKETT.

STATEMENT of operations performed at the Birmingham Dental Hospital, for three months, ending June, 1891.

	April	May	June.
Extractions :			
Under Anæsthetics	436	314	369
Without „	461	381	495
Gold Fillings	41	20	35
Amalgam Fillings	76	77	60
Osteo Fillings	94	84	67
Permanent Gutta Percha Fillings	14	8	24
Temporary „ „	13	3	36
Dressings (nerve canals treated, &c.)	243	141	165
Scalings	15	10	15
Attendances for Crowns and Regulation	78	60	66
Advice	146	138	182
Total number of operations	1617	1236	1514
„ patients attending	850	684	809

J. ERNEST PARROTT,

House Surgeon.

British Journal of Dental Science.

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DEFECTIVE PERSONAL HYGIENE AS IT AFFECTS THE TEETH. INFANCY, CHILDHOOD, AND SCHOOL LIFE.*

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It would be impossible to exaggerate the value of a good set of teeth in a healthy mouth, and that whether the denture is regarded as an important organ of digestion, as a valuable factor in the mechanism of speech, or as a decorative appendage which adds to the beauty or attractiveness of its owner's appearance. Yet there is, probably, no portion of the physical economy which is so generally and systematically neglected. It is not surprising, therefore, that the digestion, the speech, and the appearance of the bulk of the community are most seriously affected by this general carelessness, which is only equalled by the ignorance from which it arises.

Caries is the scientific name of the disease which results in the wholesale disintegration of the tissues of the teeth which are the hardest structures entering into man's composition. Its injurious effects are enormously increased by the fact, that, if neglected, caries almost inevitably leads to a train of diseases which have the greatest influence upon the well-being of the entire organism.

There can be no doubt that defective personal hygiene is a practical cause of this disease, which is by far the most continuously prevalent of all the diseases occurring during childhood and school life, and one might almost add, during infancy. Professional opinion throughout the country has long been unanimous as to the prevalence of dental diseases amongst children.

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A communication, read to the British Dental Association in 1885, advocating compulsory attention to the teeth of school children, originated a movement which has gone on with increasing force and influence ever since. The practical outcome of this movement was the appointment of a committee to arrange a uniform scheme of investigation as to the condition of the teeth of school children throughout the country in order to obtain statistics for the following purposes: Firstly, to acquire a more exact knowledge of the condition of children's teeth at various ages; and secondly, to show by means of the facts thus acquired, the disabilities under which children frequently suffer in their growth and development, and the important bearing this condition has upon the future health of the individual.

This investigation is still far from being complete, but a sufficient number of examinations of a reliable nature have been made to prove the almost appalling frequency of dental caries and other diseases of the mouth, especially during the period of school life.

The frequency of caries is due to a variety of conditions which may be assigned to two distinct categories, the one intrinsic and the other extrinsic. Intrinsic conditions are those which arise from incomplete development, deficient nutrition, or the mal-position of individual or of several teeth, all of which, by lowering their co-efficient of resistance, offer special points of attack. They must, therefore, be regarded as predisposing conditions in contradistinction to all extrinsic agencies.

Faulty structure of the teeth is the most important of all the predisposing causes of dental caries. Just as a lump of table salt dissolves more rapidly in water, on account of its porosity, than an equally large piece of rock salt, porous dentine is more rapidly decalcified than well developed, resistant dentine, because the acid can more rapidly penetrate the tissue, and less acid is required to complete the decalcification.

Deep fissures are usually found on the grinding surface of the bicuspid and molar teeth, frequently on the lingual surfaces of the front teeth and more rarely on other surfaces. These naturally favour a continual retention of food particles and thus induce caries, from the absence of an intact covering of enamel. If the enamel itself is also poorly developed then the advance of disease will be all the more rapid. Not infre-

quently owing to some inflammation while the tooth is being formed the enamel instead of being evenly distributed over the dentine presents a pitted or deeply furrowed surface. These teeth besides being, as a rule, weak, are extremely unsightly, and are commonly known as honeycombed teeth. Occasionally these teeth have a high co-efficient of resistance, in which case they are strong, but extremely ugly. These teeth are sometimes termed "mercurial teeth," because many competent authorities ascribe this condition to the administration of mercury, usually in the form of "teething powders." Such teeth are better known as honeycombed teeth. By suspending nutrition or rendering it temporarily imperfect, various diseases of infancy may cause these imperfections of enamel, which can in no way be regarded as the result of a specific form of disease; whatever the cause, the injury is effected usually during the first months of life, when it takes very little to disturb the highly susceptible functional harmony of nutrition, growth, and development.

A crowded condition or the irregular position of the teeth in the jaws predisposes to decay by forming spaces which favour the accumulation and retention of fermenting and acid-forming substances in contact with the enamel; in this connexion the form of the teeth is not without considerable influence, as teeth with convex approximal surfaces, by having their points of attack reduced to a minimum, are relatively less subject to caries than teeth with flat or slightly concave surfaces. Many of these irregularities are entirely due to preventable causes, two of which are especially important as affecting that period of life to which the consideration of the subject is at present necessarily limited. Premature loss of temporary teeth is probably an important factor, but it is completely overshadowed by the more disastrous effects of their undue retention. The roots of the deciduous teeth are not always completely removed by the natural process, and the successional tooth is thereby frequently diverted from assuming its natural position in the arch. The more serious effects, however, are produced by the retention of temporary teeth, usually in a carious condition, and frequently accompanied by a chronic abscess formation, which originated in neglected caries. Undue retention of the temporary teeth must be regarded as a predisposing cause of caries, if only from the fact that it favours the retention of fermentable matter, since the teeth cannot be kept clean either spontan-

eously by the tongue, or in mastication, or artificially by the application of the tooth-brush. A large number of these teeth, during the eruptive period, are found to be in such a condition, that the rough sharp necrosed roots protrude, and often pierce the cheek, thus accounting for the cicatricial attachments occasionally binding the cheek to the gum.

A recession or loosening of the gums from neglect of the teeth not only lays bare the dentine, but also permits the entrance of food particles round the necks of the teeth or into pockets formed by the loosening of the gums by which means a further predisposing cause for caries is furnished. This condition is most characteristic of a later period of life than that with which we are presently concerned, but the results of the examinations of the teeth of school children prove that, although this condition is relatively infrequent, it is occasionally found at this early life, when it is usually accompanied by deposits of tartar, which may be of very considerable quantity. Such a condition is entirely due to defective personal hygiene of the mouth. Many of the teeth of the school children examined show that they were in many instances, remarkably clean, although they were absolutely innocent of the application of the tooth-brush, which conclusively proves that mastication properly performed and aided by the movements of the lips and tongue is a highly important factor in keeping the teeth clean, and the mouth in a healthy condition.

Many believe that a predisposition to caries may be inherited. It cannot be denied that badly-developed, irregular teeth are inherited, and in so far inheritance may be considered as a predisposing cause of caries.

With regard to general diseases which are generally described as predisposing causes, we adopt Miller's view that they should rather be regarded as "exciting causes of caries by imparting an acid reaction to the buccal juices."

Many authorities, notably Galippe and Magitot, in France, and Harlan, Sitherwood, and Kingsley, in America, regard excessive intellectual work during childhood and adolescence as an important factor in promoting the frequency of caries. Galippe has pointed out that, while we make laws in order to prevent children working in factories at an early age, little or no heed is paid to those other factories usually known as "schools," in which pupils submit spontaneously, or are coerced into intense mental work, with a view to some examination which crowns their studies or decides their future career. There is, on the whole, good ground for believing, as these authorities maintain, that premature intellectual work reacts upon the constitution of the teeth, and that in pupils whose scholastic success is very remarkable, caries is extremely frequent.

The extrinsic agencies producing caries include the result of such general diseases as scrofula, rachitis, dyspepsia, fever, and others such as rheumatism, gout, &c., not usually associated with the period of school life. Any disease (local or general) which has the effect of acidifying the saliva, should be regarded as an exciting cause of caries, and therefore demanding special attention to the condition of the mouth, with a view to the neutralisation of the saliva. Increased attention should, therefore, be devoted to the hygienic care of the mouth during sickness, instead of which even ordinary precautions are relaxed. Even when the patient is incapable of using a toothbrush, his comfort will be increased by having the mouth rinsed by an antiseptic wash.

The chief exciting cause is the chemical change produced by micro-organisms in the fermentable matter lodged upon and between the teeth. Caries is, therefore, "a chemico-parasitical process consisting of two distinctly marked stages; first, decalcification, or softening of the tissue, and, secondly, dissolution of the softened residue." The acids, which effect the decalcifications are derived almost entirely from amylaceous and saccharine substances, retained in the fissures and defects, or on the surfaces of the teeth, and which undergo fermentation there. It is no new idea to regard the acids formed from sugar as being especially injurious to the teeth. Miller considers that starch and amylaceous substances are much more detrimental to the teeth than sugar, particularly as sugar being readily soluble is soon carried away, or is so diluted with the saliva as to be rendered harmless, whereas amylaceous matter adheres to the teeth for a greater length of time, and consequently exercises a more continued action than sugar. Fermentable albuminous substances mixed with the saliva, develop but small quantities of acids which soon disappear.

"The second stage of caries, namely, the dissolution of the softened dentine by bacteria, and is directly detectable under the microscope, and may be easily accomplished experimentally." The albuminous substance contained in the dentine forms, indeed, an excellent medium for the growth of bacteria with the result that the soft tooth tissue is dissolved by the bacteria ferment, much as white of egg is by the gastric juice. The rapidity with which the process of destruction of the teeth advances in any mouth, is evidently directly proportional to the intensity of the fermentation going on in the cavities or

spaces where the food is retained, and inversely proportional to the density of the tooth substances.

The main points to be remembered are that caries is due to extrinsic or external causes which proceed from without inwards, and that as they affect most rapidly and completely those tissues which are richest in organic matter, the dentine, of which the bulk of the tooth is composed, is more quickly destroyed than the enamel; and, further, that the action of micro-organisms play by far the chief rôle in the production of caries. In a scientifically clean mouth, therefore, there can be no caries. Prophylactic precautions, then must consist in judicious efforts to sterilise the mouth for it is obviously impossible to confine the diet to albuminous fermentable substances, such as flesh, eggs, &c.

With the appearance of the teeth arises the necessity for the application of personal hygienic precautions. In determining the necessity for these precautions, the mouth may be regarded as an incubator, in which not only are the conditions of heat, humidity and oxidation perfectly realised, but bacteria and the culture medium are almost inevitably constantly present. Having thus acquired some idea of the nature of the disease, and the causes by which it is produced, it is well worth considering how far these latter are under our control, especially as related to the period of life with which we are more immediately concerned.

Faulty structure is mostly dependent upon systematic conditions both of the parent and the child during the earliest part of the formation period of the teeth, and therefore is very largely beyond our control. It is important to remember however, that, although the period of development begins particularly early in life, it is more or less actively continuous to a relatively late age, as the process of calcification, which begins some five months before birth, is not really complete until the age of about twenty. It is evident, therefore, that much may yet be done to improve the quality of the tooth structure, even although some injuries and defects be already beyond repair. Both the bones and teeth, containing as they do a large percentage of earthy matter, necessarily require during the period of their growth a very liberal supply of those substances to the blood which can only derive those constructive materials from the food.

Those food stuffs best calculated to promote the formation of strong teeth should be prominent in the dietary of infants and children. It would take too long to discuss the most

appropriate dietary, suffice to remember that the chief article of food, the so-called staff of life, is made somewhat of a broken reed by the senseless practice of measuring its quality by its whiteness. The production of this very whiteness necessarily means an exclusion of that portion of the wheat which is richest in nitrogenous and earthy matter; while again, a dark or brown colour is no certain test of its dietetic value, for much of the so-called whole meal or brown bread is but a commercial fraud. The bread as made for and supplied to our prisons may be taken as a type of what wholesome bread ought to be. As oatmeal is a well recognised and wholesome article of diet, it should be remembered that while the removal of the finer bran from wheat reduces the amount of nitrogenous and fatty contents of the flour, the removal of the husks from oats has precisely the opposite effect, so that the finer the oatmeal the richer it is in those ingredients.

It is also important that the food should offer to the teeth a salutary resistance which they must overcome, since the mechanical action exercised by such food stuffs has the very best effect upon the tooth structure. It is a well recognised law of general application that every organ which we do not use ends by becoming atrophied or by losing its functional energy. The more the teeth are used in mastication the better they will be able to stand the attacks which they must inevitably encounter. If this is once rightly apprehended the importance of the first teeth becomes strikingly obvious, for as the "Lancet," commenting on Mr. Fisher's plea for the compulsory attention to the teeth of school children, says, in discussing this question: "If we wish to get at the root of the evil we must commence our treatment with the deciduous teeth. Many patients—nay, even medical practitioners—ask, what is the use of preserving teeth which have only to serve their purpose for a time, and which nature will replace? If a surgeon were asked what is the use of provisional callus in a case of fracture his answer would be readily formulated, and just such an answer is applicable to the teeth. We will run over just a few of the points that may result from disease and its neglect. First, with regard to the child's health, with decayed teeth and often in addition chronic gumboils, the little sufferer is kept awake at night and his digestion affected by inability to masticate his food, and more so by swallowing the fetid discharges from the abscesses. As a consequence the child becomes weak and puny, and so the already developing teeth

suffer from the constitutional disturbance. Supposing each tooth as it becomes the seat of disease is extracted, then the masticatory power is greatly enfeebled, and moreover it has been shown that where many deciduous teeth have been removed, especially in the case of the canines, the jaw does not develop as rapidly as it should do, and consequently when the permanent teeth erupt some take their position inside and some outside the arch, which irregularity is a potent predisposing cause of caries, apart from its unsightliness. Again, take for instance a very common case, that of the second temporary molar extensively decayed. The first permanent molar assumes its due position posterior, the first bicuspid anterior to it. Both these permanent teeth are frequently found affected on the side corresponding with the deciduous teeth, and the disease is undoubtedly due to the infection from decomposing food harboured by it. Although much more might be said upon this subject, we think that enough has been advanced to show the importance of the first teeth with reference to the welfare of their successors, which should, but so often do not, do duty for a lifetime. We believe that nothing short of the periodical examination every six months, and treatment if necessary, of the teeth of children can effectually cope with this evil."

A further means by which we can counteract or limit the ravages of caries are well summed up by Miller, who is our greatest authority on the action of micro-organisms of the human mouth: "By repeated thorough systematic cleansing of the oral cavity and the teeth, to so far reduce the amount of fermentable matter as to materially diminish the production of acid as well as to rob the bacteria of the organic matter necessary to their development; by prohibiting the consumption of such foods and luxuries which readily undergo rapid fermentation, to remove the chief source of the ferment products injurious to the teeth; and lastly by a proper and intelligent use of antiseptics to destroy the bacteria and to limit their number and activity."

Mechanical cleansing exercises a great influence upon the process of fermentation in the human mouth; and, therefore, as soon as the temporary set of teeth is fully erupted, a suitable tooth-brush supplies the best method of cleansing, which operation should be performed daily, the most efficient time being after meals.

Efficient use of the temporary teeth in mastication is important in order that both the permanent teeth and the jaws

may be made stronger and better developed, it is imperative to see that no crusts of bread are left or disposed of by being dipped in tea or any other similar fluid. Statistics prove that the state of the first teeth is, in something like the two-thirds of the infants examined, already such that by the fourth and fifth year their masticatory powers are seriously impaired.

Any thorough system of prophylaxis must include periodical examination of the teeth by a competent dental practitioner, more especially as the arrest of caries is, generally speaking, easy of accomplishment, if only it is taken in time, which is usually long before the process has signalled its presence by the causation of pain. If the child's denture is in such a condition that efficient use causes uneasiness or pain, it is a sign that the case requires urgent attention.

The tooth-brush is too frequently used improperly, the action being confined to a more or less superficial application of it to the external or labial surfaces of the teeth with a to-and-fro motion. Its proper application consists in its being applied to all the surfaces of the teeth as far as possible. A rotary motion is the most effective, since the to-and-fro motions merely polish the surfaces which the motions of the lips, cheek and tongue keep tolerably clean. The brush should be made, first of all, to impinge upon the gum, and then be carried towards the masticating surfaces with a rotary motion. The upper teeth must therefore be brushed from the gum downwards and the lower from the gum upwards. The to-and-fro motion will suffice for the cleansing of the masticatory surfaces.

With regard to the kind of tooth-brush, a round handle facilitates the rotary rotation and the bristles should be of medium stiffness, not too hard, otherwise the gums may be unduly lacerated. By dipping the brush into hot water the bristles may be softened to the proper consistency. It should be remembered, however, that one is more likely to err in the selection of too soft rather than too hard a tooth-brush. Brushes with soft bristles are bad, and words are not strong enough to describe the stupidity of employing such a "make-believe" as the badger-hair brush. As a rule, most tooth-brushes are made with an unnecessary number of bristles, and the bundles of bristles are too close together, where they are inserted into the back of the brush. Such brushes soon become clogged towards the back with an

objectionable mass of tooth-powder, epithelial scales, and food *debris*. The india-rubber tooth-brush is also of comparatively little use for cleansing purposes. The tooth-brush should never be enclosed in that wretched piece of toilet ware, known as the tooth-brush tray, after use, the tooth-brush should be dried on a towel and placed in a rack or jar to drain and allowed to dry freely exposed to the air and sunlight.

Frequently the use of the tooth-brush becomes perfunctory or is given up entirely, because of the gums bleeding. The more the gums bleed on brushing the greater is the necessity of not only continuing the brushing but of increasing the vigour of its application. Any extreme readiness of the gums to bleed is the sure indication of their being in a diseased state, and the vigorous brushing, with the consequent bleeding, will usually bring the gum into a healthy tonic condition, in which they present no tendency to bleed.

Even if the tooth-brush is applied in the most thorough manner, it is difficult to prevent the lodgment of fermentable matter between the proximal surfaces of the teeth. Waxed floss silk may be introduced between even the closest teeth, and, as it is gently drawn to and fro towards the neck of the tooth, surfaces are cleaned which would never be reached by the tooth-brush. Ordinary embroidery, or skein silk, cut into short lengths and drawn across a piece of hard beeswax is quite as efficient, and much less expensive, than the spools of wax floss silk, especially made for dental purposes. Short lengths of india-rubber, square or round, such as is used in the manufacture of elastic webbing, will also act in similarly efficient way by being stretched. It passes between the teeth at the masticating surfaces, and on the the tension being relieved it fills up the larger spaces towards the next, and as it is drawn through removes the *debris*.

Where teeth are placed somewhat apart, or where teeth stand alone, short lengths of ordinary thin narrow linen tape will be found efficient agents, while narrow silk tape, also well waxed, would be better where the teeth are closer. Narrow strips of tracing cloth, such as is used by architects, is another material which may be used either with or without being waxed, and has the advantage of being waterproof. Where the tendency for the formation of tartar is great the charging of the ligature or the band with tooth-powder will do much to prevent the formation of deposits, presuming, of course, that the teeth have been first of all scaled. Such a

cleansing as this will take a considerable time for its proper execution, and, if the ordinary daily cleansings are thoroughly carried out, the more extensive processes of cleansing need only be performed at longer intervals, say about once or twice a week. The importance of attention to the cleansing of the proximal surface is apparent when we know that, with the exception of the grinding surfaces of the molars, the majority of the cavities of decay are on these surfaces.

The use of the toothpick is unfortunately essential to the comfort of some adults, but it should not be thought of as a cleansing instrument for the teeth of children.

If one starts with clean teeth, the teeth may be kept fairly clean by means of the tooth-brush, plain water, and floss silk, and "time," much time being given to the operation. In the light of our increased knowledge as to the etiology of dental caries the particular value laid on tooth-powder tends rather to decrease than to increase. There can be no doubt, however, that the use of tooth powder greatly facilitates the retention of the natural colour of the teeth, which I think is a better way to put it than using the stereotyped expression that the use of a tooth powder makes the teeth whiter; that a good tooth-powder does not and should not do so. All that may be reasonably expected of it is that it will remove, by mechanical friction, stains and discolorations obscuring the natural colour of the teeth, which is after all far from being white.

The principal action of a tooth-powder, then, is mechanical rather than medicinal. It is important, however, to regulate its frictional power. The powder should be very finely grained, and not gritty, therefore it should contain no cuttle-fish powder, no powdered oyster shells, no pumice powder, since these substances are too mechanical in their action. It should consist of alkaline substances, and contain no acid ingredients or such as are capable of changing to acids in the mouth, since these are extremely destructive to tooth structure.

The presence of an antiseptic agent in the tooth-powder is desirable. Some antiseptic ingredients of tooth-powder are, however, to be condemned, for instance, charcoal and charred bread, although both antiseptic and frictional, are too gritty, and from constant use leads to the formation of a permanent bluish border to the gum, owing to the particles becoming buried in the tissues.

Miller recommends precipitated chalk, taken up on the tooth-brush with a dash of neutral or slightly alkaline soap, bu

he also considers a tooth-soap as being preferable to tooth-powder. He has also pointed out that as a matter of fact there is no evidence whatever that anything has as yet been accomplished in the prophylactic mouth wash alone. "It would, however, be going too far if we were to adopt the views of those who have expressed the opinion that by proper care of the teeth and constant use of antiseptic washes from childhood, on decay would be entirely banished from the human mouth. This view is too optimistic, for various reasons, chiefly because there are places in every denture which will remain completely untouched even by the most thorough application of the antiseptic which will reach them in so diluted a condition that it possesses little or no action. If a very thorough mechanical cleansing has not preceded the antiseptic, its action upon the centres of decay will be equal to little more than zero. The great difficulty lies further in the fact that nearly all the materials which possess antiseptic action are either contra-indicated altogether in the mouth, or that they may be used only in very dilute solutions either because they are injurious to the general health, or locally to the mucous membrane or to the teeth themselves. Finally, many otherwise useful antiseptics are excluded because of their bad taste and smell. For these reasons the preparation of a mouth-wash which possesses antiseptic action of any importance is accompanied by the greatest difficulties.

Miller has made an interesting series of experiments in order to determine the time necessary for devitalisation with a number of the antiseptic materials in the form of a mouth wash. As the time during which rinsing the mouth the wash remains in contact with the teeth varies from a few seconds to at most a minute, it will at once be seen that in order to sterilise the oral cavity a material must be found which is capable of devitalising bacteria within a minute or less. It is possible after the complete mechanical cleansing of the mouth to obtain by means of a solution of bi-chloride of mercury (1 in 2,500), the almost perfect sterilisation of the mouth. On account of its poisonous properties and still more, perhaps, from its horrid and undisguisable taste, this material is not suitable for general application.

Listerine which consists of oil of eucalyptus, borobenzoic acid, winter green oil, &c., has been proved experimentally to be a very useful antiseptic mouth wash. It should be applied

on a brush on cleansing the teeth or slightly diluted as a mouth wash.

The best means, then, we have towards attaining this seeming impossibility of having a scientifically clean mouth is to rely on a very thorough application of mechanical means. tooth-brush, floss silk, &c., aided by antacid and steralizing washes, the efficacy of which will be in proportion to the time of contact.

The hygiene of the sick-room has been excellently treated except on the question of defective personal hygiene as it affects the mouth, and as the subject is not mentioned as far as I know in any published work on the care of the sick, nor even in any popular treatise on the teeth, a few words here may not be out of place.

As a matter of fact, very few trained nurses give any attention to the teeth of their patients, everything else is carefully looked after, and kept clean with the exception of the mouth. As we have seen bacteria play a very important part in the destruction of the teeth even in ordinary health, it is, therefore, easy to understand how much more that condition must be aggravated in the mouth of, say, a typhoid fever patient. The decay that frequently ensues from such cases is ascribed to constitutional conditions, but when we consider the increased temperature which accompanies the fever and the character of the dietary which is necessary to be given, and of which a large portion must remain in contact with the uncleansed teeth, it is evident that the bacteria have more than usual facilities for producing caries which in such cases must be regarded as arising from neglected local conditions.

Dr. Briggs, of Boston, has published some valuable hints and directions on this subject, and rightly emphasises it with a view to the comfort of the invalid: "If you wish to see a grateful patient, rinse the mouth with some antiseptic solution, after he has been left for days without care!" I have had people tell me that nothing done for them in the course of their illness gave them such a feeling of comfort and rest as purifying the mouth.

In extreme cases, where the patient is in a comatose condition, the mouth can be wiped out with a soft cloth wet in the antiseptic solution; but in most cases I have found the ordinary invalid feeding-cup to answer the purpose nicely. The patient takes the solution into the mouth through the long spout, and, having rinsed thoroughly, closes the lips about the

spout and forces the liquid back into the cup, all done without raising the head from the pillow.

I have no doubt there are physicians and nurses who attend to this matter, but I also doubt not that they are few and far between.

The proper time for the principal act of this personal hygiene is after the last meal. To brush the teeth in the morning only, is to lock the stable door after the steed is stolen. To do so after each meal must obviously be salutary and so economic a proceeding, that the time necessarily involved is far from being wasted. To those who have never acquired the habit, it may seem irksome and unnecessary, but to those who have done so, comfort is not complete without even these supplementary cleansings.

Shortly after taking my degree at the Harvard University, in 1876, I was called upon to act as dental officer for a short period, in a school devoted to the training of some poor gutter children, near Boston, U.S.A., and never shall I forget my first visit to that school, and seeing the children turn out promptly after dinner to what we may term their usual tooth-brush parade. In that school they needed not my instruction, but only my professional services in repairing the small amount of caries, inevitable even amongst such well cared for mouths. My fee was paid out of the private contributions of the members of the committee, a highly intelligent body of men and women, who showed the appreciation of the services of their own family dentist in the best possible way, by caring for, and treating the teeth of those poor children as if they belonged to members of their own family. Nor could I help contrasting this state of affairs with the miserable treatment I myself received when at school. In our dormitories there hung at the end of each bed, a bag for the reception of the brush and comb and I well remember, on its external aspect a long mysterious narrow pocket, evidently intended for the reception of the tooth-brush handle. During my residence of seven years in that school, I never saw within the walls of the institution a tooth-brush in one of these pockets, yet it was a rich institution, in fact so rich that it really did not know how best to spend its income. There was a dentist attached to the school, but my own experience, like that of the other boys, was ruthless extraction of our teeth when they ached. I have since learned that he received the munificent sum of £10 a year for his services in a school of 180 boys, and I

further know now that this skilled and scientific practitioner delegated his functions to the none too delicate hands of his pupils with a view to giving them practice. No attempt to prevent pain and suffering and the loss of valuable organs by filling, no advice as to cleansing or caring for them, came within our ken. Better for me, at least, better for my dental armature, had I been one of those gutter children at that American School than the successful scholar in that rich Foundation School. Better the intelligent care of that considerate lay committee than the ruthless indifference of that highly qualified school dentist.

If I have seemed to dwell unduly on this question of oral hygiene, it is for a very simple reason. The economic aspect of any proposed measure of reform must always demand careful consideration, but it would be impossible for any body of school managers to assert with reason that any reform of school oral hygiene presents any serious economic difficulty. While the initiation of any reform rests with the authorities, it is the superintendents and the teachers who must be the active agents in its application. Teachers in schools where the children are resident cannot escape from their vicarious parental responsibility. They may, like parents, descant on the alleged impossibility of getting children to brush their teeth, forgetting that the regular cleansing of the mouth is as teachable as the washing of the face.

In the schools examined on behalf of the British Dental Association the mouths of all the scholars were certified as clean in one school only, the Church of England Home for Waifs and Strays, Marylebone Road. Here the excellent tooth-brush habits are encouraged by a system of good marks which is sufficient proof that the result is due to a difference in the authorities rather than in the scholars.

One good and direct effect of our collective investigation has been the introduction of a tooth-brush into some of the schools examined. That the mere supply of a tooth-brush is insufficient, is proved by the return from a small better class school in Cambridge where the boys resided with their parents or guardians, and in every case acknowledged their possession of a tooth-brush. Not a single mouth could be registered as clean, all dirty and a few very dirty. Inquiries as to when they used it elicited such replies as "on Sundays," "twice a week," "occasionally," "when I go out to tea." &c.

The authorities thanked me for calling attention to this

condition of affairs, and announced their intention of having it remedied.

We must now consider as briefly as possible the necessity for remedial treatment for this disease which is so characteristic of all the periods of school life from infancy onwards.

As the temporary teeth have already been alluded to, let us now consider the principal features of the British Dental Association investigation. A very small percentage of children have mouths free from caries and a still smaller percentage not requiring dental treatment of any kind. In the schools generally it is found that the ratio of children with sound permanent dentures fully completed as respects age is only ten per cent. Some of these present irregularities, are dirty, or are marred by the presence of unexfoliated roots of the deciduous teeth. In a large number of cases the cavities are few and in such a condition that a short and almost painless operation would save the teeth for years and in some cases for life, were proper hygienic care bestowed upon them. Indeed in such teeth, where the decay had been removed and the cavity filled, would actually be in a better condition than when erupted as all such early carious cavities are dependent upon structural defects such as pits and grooves in the enamel. This latter fact is further illustrated by the tendency of the corresponding teeth on each side of the mouth which are developed at the same time, to become carious. Despite such inherent defects, teeth have a high co-efficient of resistance, so that decay soon after eruption is no sign that the teeth must inevitably be lost.

In another series of cases we will find many cavities, but still in an initial stage, in which, besides the pits and fissures, we find the approximal surfaces attacked, mainly in front teeth. In yet another series, we will find from the rapid development of caries that a few teeth are already too far gone for any treatment, otherwise than by extraction, such a condition may be found even within a few months after eruption. Still these cases are only advanced stages of cavities, which were once in the incipient stage, and therefore once saveable.

In a very small percentage of cases, about ten per cent. at most, we find a large number of cavities in an advanced stage. In such cases any remedial treatment will have to be renewed again and again, as no process of filling can affect the low co-efficient of resistance, though diet, outdoor exercise,

and use of the teeth may improve their quality as age advances.

In quite a number of cases the labial surfaces of the teeth are found to be seriously affected, not so much by cavities as by surfaces of decay extending over the enamel, such a condition is entirely owing to habitual uncleanness as the teeth are often covered with a thick coating of a pasty starchy mass of food debris. If the decay has not extended beyond the enamel, thorough cleansing and polishing of the enamel may arrest the mischief.

The tooth most frequently affected with caries is the first molar which is erupted during the fifth, sixth, or seventh year. It is too frequently regarded, or rather neglected, as belonging to the temporary dentition. The first permanent or so-called sixth year molars are the largest teeth in the mouth and therefore very important factors in mastication. Indeed for the six years intervening between the eruption of the first and second permanent molars, it forms the only masticating surface, which is continuous during the transformation of the temporary into the permanent dentition. They have no successors and should not be allowed to become extensively decayed ; even if they cannot be permanently saved, there are good reasons, with reference to the preservation of the integrity of the arch and to the requisite growth of the jaws, why they should be retained until the second molars (twelfth year) are erupted or erupting. Statistics, show that the lower molars begin to erupt soon after the age of five years, and except in a few cases are complete in about two years. The upper molar is very slightly later in its appearance, follows much the same course of eruption. About six and a quarter years, where the dentitions were bad, roughly two-fifths of the 50 per cent. and a year later more than a half of molars erupted were decayed, or already lost. As age advances the proportion of caries inevitably advances higher and higher.

The economical aspect of treatment at this age is of the highest importance, for caries is essentially a disease of youth, from its dependence on predisposing causes which diminish as age advances. Most weak points in structure, pits, depressions, and proximal surfaces, will have been attacked before the age of 17 or 18, and almost all which will even succumb by the age of twenty-five years. Further,

a cavity of decay in the proximal surface of one tooth usually leads to its neighbour becoming affected, and thus far caries is an infectious disease. Even in bad cases if the caries can be eradicated and excluded for a time, its control becomes fairly easy if the patient performs rigorously his share of the preventive work.

It is also certain that if certain teeth must be extracted, the best time for doing so is between the eleventh and the thirteenth year, and to effect this a considerable number of the molars must be temporarily filled.

Treatment during school life directed to the amelioration of any irregularity of the teeth must be an important factor in minimising the number of carious cavities by the removal of a not infrequent predisposing cause. Moreover in many cases where the position of the teeth are quite regular, it is found that the extraction of four teeth, most frequently the first molars, or more rarely either of the bicuspid, is in its final effect more truly conservative treatment than their retention by resort to pure restorative operations.

The greater the likelihood of the individual being unable to procure the alternative restorative treatment in later life, the greater is the necessity for applying this remedial radical treatment technically termed symmetrical extraction. This operation to be most successful should be performed from the eleventh to the thirteenth year, according to the eruption of the teeth. If it is deferred to a later age than the fifteenth or sixteenth year, there is great uncertainty as to the final results. The subsequent movement of the teeth which results from judiciously applied symmetrical extraction is such that even an expert may doubt in later years, as to whether the first molars have been extracted or not, whereas the functional value of the denture as a masticating organ may be ruined by the indiscriminate extraction of the same number of teeth.

To ignore the abnormal or diseased conditions of the teeth during this period (from the sixth to the sixteenth year), even if unaccompanied by pain, will inevitably lead to a partial, if not a complete, wreckage of the dental organism as the functional unit, earlier or later, in the third period of the individual's life history. There can be no question that from the trifling attention, and often from the entire lack of attention, paid to the teeth during this important period of eruption, a very large number of patients are doomed to pass through the third

and major portion of their lives lamed and crippled so far as their jaws are concerned, or obliged to put up with the relatively poor comfort and frequent discomfort of artificial substitutes. The lack of the watchful care of a thoroughly qualified dental practitioner, especially during the first half of the eruptive period, frequently entails resort to the cumbersome, the discomforting, and the expensive mechanical appliances for the correction of irregularities which might have been easily avoided.

During the past 10 years I have had an opportunity of acquiring a pretty thorough knowledge of the average condition of the teeth of the University undergraduate, and have seen the fearful destruction caused by dental caries in the mouths of those who may be taken as typical of all that is best so far of social condition, physique, and means can afford mitigation or relief of these conditions.

If we regard for a moment even the purely academic aspect of some of these cases, is it not a deplorable short-sightedness and a sense of false economy, which leads both the parent and the schoolmaster, by the neglect of attention to the dental organism during this eruptive period, to run the risk of a complete breakdown of the student on the eve of an all important examination from pain and suffering with his teeth? The period of the ordinary, and especially of the honours and the tripos examinations at Cambridge, are characterised by a notable increase in the number of acute cases calling for treatment, and I have known more than one case where the students position in the class list was materially affected thereby. What is true of this class of the community must be also more or less true of others. An intelligent student somewhat surprised me the other day by asking why it was that the parent and schoolmaster were generally so particular as to the quality and sufficiency of the food at school and so utterly disregardful as to whether the boys had or had not an efficient dental mechanism for the assimilation of that food. Of course my only reply could be that it was in consequence of their utter ignorance of the importance and the advantages, both economic, and, as I am also convinced, educational, derivable from adequate attention to the teeth of the school children.

Without dwelling on the prevalent neglect of the teeth during early life, and the great amount of severe pain, loss of teeth, and the consequent incapacity for complete mastication—entailing

indigestion and other serious maladies—to which that neglect leads, I should like to refer to the evidence of Mr. Bennett Williams, who kindly afforded me the opportunity of giving my first public lecture on “Preventive Dentistry” to several hundred parents of children attending a board school in one of the poorest districts of North London, more especially as he called attention to a fact which cannot be without interest in such a Section as this, namely, that a defective condition of the teeth may seriously impair their function as a part of the mechanism of phonation. He states that his experience as the head master of one of the largest London board schools, and the exceptional opportunities he has had for over a quarter of a century of noting the various changes in the health of the children of our working classes, convinced him that more sickness than is generally supposed is directly traceable to neglected and defective teeth. He has further observed that many cases of imperfect articulation, sometimes unhappily becoming a life long habit, are due to the same cause. He thought that the lecture clearly proved that a good deal of the evil is easily preventable, and that the knowledge of a few simple truths, coupled with a little timely attention on the part of the parents, cannot fail to be of the utmost importance to the well-being of the children; and if the very necessary and valuable information which was imparted by the illustrated lecture could be more widely known, and if increased facilities could be afforded to the poor for securing skilled attention in cases of special difficulty, he believed that great national benefit would result.

As a contrast to this, so far as the class of the patient is concerned, and as typical of the condition where individuals might have been expected to have fully availed themselves of the advantages of modern conservative dentistry, I would quote the evidence of a distinguished tutor at Trinity College, Cambridge. He advises his pupils to have their teeth put thoroughly in order, as he has found so many of them break down at examination time from acute pain. These cases are always of the third or fourth degree of caries and therefore of long standing, and involving disease of the pulp or the pericementum.

In the course of tabulating the British Dental Association's statistics I was prompted to place the returns of teeth filled amongst the “accidents,” for the very simple reason that I had before me the condition of about 2,000 mouths and only

two teeth returned as having been filled. Out of about 40 schools examined I found only one to which a dentist has been appointed, and who was compensated in such a manner that his professional service was not confined to merely extracting teeth. This school is the Metropolitan and City Police Orphanage at Twickenham. A careful perusal of the report of the board of managers of the year 1890, shows that this institution is very largely supported by the contributions of the various police divisions. The dental surgeon's report is instructive, and the result of the statistical inquiry for the association is a very satisfactory proof of the utility of qualified professional skill. Under all the heads of inquiry this school contrast very favourably with the others. In fact, it headed the list of having the lowest number of teeth requiring attention, as related to sex and average age. The number of boys examined was too small for comparison with other schools. The number of girls (84) is sufficient to give average results. The lowest age was 8 and the highest age was 15, and the average age was 12 years and 8½ months. The number of temporary teeth requiring filling was eight and the number requiring extraction was 31. The number of permanent teeth requiring filling was 31, and the number of teeth lost was 19, and the number of teeth demanding extraction was 49. The number of teeth filled was 67, a figure which is quite unique in our investigation so far. In estimating the number of teeth which had been attacked with caries, it was necessary to correct the total of teeth requiring attention and the ratio was thus raised from 118 per cent. requiring attention to 197 per cent. originally defective, thus showing that the number had been reduced by 80 per cent. The dental surgeon attached to this school may well be proud of this achievement, as it represents an expenditure of professional time, for which in my opinion, he is only partially remunerated by his annual salary of £20.

The Managers of the North Surrey District School at Anerley, appointed a qualified dental surgeon some years ago. The dental surgeon attends one morning in each week, the school directors supplying instruments and materials and giving a salary of £60 a year. As there are 850 boys and girls between the ages of 3 and 16, I believe the remuneration is insufficient if the work be efficiently performed.

In a few other schools, appointments have been made with satisfactory results, except where the amount of remuneration is so inadequate that only extractions are done.

It is not creditable that even the poorest children should continue to be subjected to a cruel operation which it is perfectly evident might be avoided in a very large proportion of cases.

The following report in connection with the Dundee Industrial School, containing 200 boys and 85 girls, from Mr. Fisher's case book, is more to the point. These are the words of the report: "Toothache seems the great, and almost the only trouble in the schools. The housekeeper said that if they had a dentist they could dispense with the services of the physician; as yet they have no dental attention beyond an occasional extraction when a child is suffering from acute pain." Mr. Fisher has also shown the economic aspect of this question, especially as related to industrial schools, by showing that to continue neglecting the teeth of these children—when they are at the age that the maximum of benefit may be attained with the minimum of work—seems to be something like our Legislature continuing a vice against itself, as the very boys the Home Office endeavours so well to develop physically strong, and on whom the Treasury spends so much, are ignored by the Admiralty if they have the misfortune to be in the possession of a few bad teeth, when it is scarcely possible for them to be otherwise, as they do not get their fair share of attention and treatment to sustain their physical life.

With regard to the better-class schools, and especially those where the pupils are not resident, I would suggest the appointment of a dental officer, not necessarily to supply professional services to the pupils, unless the parents had failed to have the teeth attended to by their own dentist. Nothing should be done to interfere with the rights of the parents to consult the dental practitioner in whom they have most confidence.

An alternative plan which is already adopted by some, in this respect, intelligent schools, is that a certificate from some reputable practitioner that the teeth are in order should be required on entering the school, and also on the return from each vacation. Autocratic as such a suggestion may sound, it is justifiable, for our contention is that just as children suffering from other diseases are declined until restored to health, so those suffering from dental diseases should be refused as unfit for scholastic work.

While apologising for taking up so much of your valuable

time in bringing this subject before you, I am conscious that I have not done justice to its importance, partly from the difficulty of treating so difficult a subject in anything like a reasonable time. I trust, however that I have said sufficient to place the matter in a new light, and would refer those who are desirous of further information on this subject to the papers already published by Mr. Fisher in pamphlet form, and containing much interesting matter on a question with which his name will ever be remembered, and also to the forth-coming report of the British Dental Association, on the condition of the teeth of School children.

THE WHEN OF EXTRACTION.*

By DAVID HEADRIDGE, L.D.S., Eng.

MR. PRESIDENT AND GENTLEMEN,

Dr. Dean, in one of his contributions, says, "capacity for judgment in dental matters is to be obtained by practice in determining similarities and sequences." It is with a belief in the soundness of this view, that I, who am but on the threshold of dentistry, merely attempt in the following pages, to collect a few classical opinions on this important subject, that they may furnish material for your discussion.

The *Temporary Teeth*, the vexed question of their extraction has occasioned much dispute, and even our text books antagonise in views. What then have we as the principles of this discussion? We have as an accepted axiom that "arrest of development follows in proportion as a growing organ, or group of organs, may have been deprived of their natural use or exercise." On this ground, it is argued, an early extraction, by diminishing the natural and important function of mastication, causes the jaws to lack their full development, and a crowding and consequent irregularity of the permanent teeth, a result to be regretted; and as Mr. Kingsley has pointed out, this affects most the late arriving permanent canine, for the space occupied by the temporary teeth, is sufficient to accommodate the permanent teeth, at the

* A Paper read before the Students' Society of the Manchester Dental Hospital.

period of eruption of the canine, however, to the latter's exclusion, and he therefore advises the deciduous canine should be retained, unless, as he says, "the health and comfort of the child would be sacrificed in so doing ;" or the extraction of a bicuspid may be necessitated. Perhaps also the denser cicatrical tissue, with the approximation of the alveolar borders upon its contraction, may play a part in these aberrant results, but as Mr. Weiss writes, of more importance is their loss, which is that of the directing agency of the permanent teeth, and the latter have to open their way through tissue unyielding before them, a very likely cause of irregularity. However prepared to meet these drawbacks, extractions may be sometimes indicated, and firstly, though rarely, are we called upon to operate upon the new born child, yet occasions have happened, necessitated from the irritation caused to the nipple by children born with some of their incisors, the latter fact not overlooked by Shakespeare, for in his Richard III.

"Marry, they say my uncle grew so fast,
That he could gnaw a crust at two hours old,
I was full two years ere I could get a tooth,
Grandam, this would have been a biting jest."

and one which is associated with the names of Cardinal Mazarin, Louis XIV, and Mirabeau.

2. Again, abscess formation may have objectional results not only from displacement but injury to the developing tooth, that a sacrifice would be preferable, and more especially says Mr. Tomes does this apply to the temporary molars.

3. The appearance of the permanent teeth or loosening of the temporary, at the general period of such appearance is a justification for the latter's removal, which as emphasised by Mr. Quinby, should be confined solely to the respective members of the two series, for extending our operations, say to a lateral, for after the permanent central, the lateral comes, and the temporary canine has to be lost, so also the bicuspid falls for the canine, whereas, if we had more confined our attention, a normal wedging would have maintained relationships.

4. When, however, they are long retained, and the maxillar expands beneath the fang, Salter advises their removal, as the permanent successor will be beneath, in these cases, we are often in a doubt, for temporary teeth may be retained

to an advanced age, as a model in our museum shows 2 upper temporary canines at 30, and I have lately had two patients, one 18, the other 23, in whom it has just come down, but in the former no signs of its appearance were manifest, unless we take a slight looseness of the tooth.

5. Stumps at or near the period of eruption should be removed, as the fang of a dead tooth being less readily absorbed may divert the successor from its course, and Wedle says that dilaceration may result from such obstruction. Here it may be convenient to mention a condition which merits instant removal of the tooth, viz., when the fangs are extruded from the alveolus causing ulcerations of the side of the mouth, not unfrequently seen in hospital practice, and giving rise to those bands of fibrous tissue passing from the gums to the cheek.

6. Pain should rarely necessitate extraction, but this period is an essential one in the child's progressive history; mar it then by prolonged suffering, for prophylactic treatment is not always sure, nor may it cover an extended period. We must note what Professor Hilton tells us, "Rest, he says, is the necessary antecedent to the healthy accomplishment of both repair and growth," and further "children who are ill and lose their rest, waste very rapidly," and this interruption of rest by local disease, affects the young far more rapidly than older people.

Now for the *Permanent Teeth*. We here must pause, a false move may place us in an unenviable position, for "the execution follows so quickly upon the verdict, that it cannot be revised or reversed. Mastication, expression, articulation and antagonisation, are important features which may be enhanced or destroyed by its discriminate or indiscriminate practice. We see how so much expression of the face depends upon the canine tooth, supporting the wings of the nose, and how deep objectionable wrinkles mark their loss, as Kingsley says, "their can be little justification for creating a deformity of one feature, in the process of correcting a deformity of features less exposed." These æsthetic questions, must in some cases be placed before those of utilitarian value. Again, the secondary effects of shock, hæmorrhage, injury or impairment to the general system and the like, contribute dangers to its employment. Some of our "little patients" may exhibit much fortitude at the expense of vital energy, then beware of chorea, and hysteria. Avoid operations on women at the period

of menstruation, a period, which according to Strohl, generally occurs during 1st quarter of the moon, for in such bleeding may continue from the socket until the function is over; of lactation, for poisonous ptomain products have been developed in the milk from reflex nervous agitation, and during the closing months of pregnancy, premature labours, monstrosities and deformities are no impossible dangers. Hæmorrhagic diathesis and epilepsy should make us guarded. To classify my remarks on this section of my subject, I adopt the fundamentals of that given by Taft.

1. To obtain relief from pain.
2. To prevent pain in the future.
3. To relieve diseased conditions of contiguous parts.
4. To anticipate, or obviate irregularity.
5. To prepare the mouth for the reception of artificial teeth on plates.

1. *To obtain relief from pain.*

Much may here depend upon the disposition, temperament, and occupation of the patient; though a conservative treatment should at all times be preferred, yet all remedies may prove futile; as Dr. Retzins says, "In some constitutions the vitality is so low and nature repairs so tardily, that although you may drown the tooth in germicides, though you may fill the roots ever so perfectly, in such depraved organisms at every depression of health, a pulpless tooth is at all times liable to brew trouble and sometimes, in spite of my best efforts, the forceps has had to be applied."

Pain may be the result of many causes with such an intricately associated nerve as the V, and wide areas by the property of "irradiation" may become its seat. This "sympathetic irritability" if we followed the patient's advice would often carry us from the true cause, for pain really due to the wisdom teeth may be referred to the bicuspid, or from the lower ones sometimes to the ear, the upper teeth, the infraorbital foramen; canines and bicuspid, to the temple; molars to the upper and posterior part of the head, and the lowers to the uppers; especially is this difficulty marked with patients not accustomed to pain.

Again we must be on our guard for constitutional sources such as.—

Syphilis.

A gouty or diabetic diathesis etc.

Cold ;

Pregnancy ;

Rheumatism of the jaw ;

Mercury in the system ;

for these are liable to lead to a mistaken diagnosis. The most potent causes, we can name, are

1. Diseased pulps,
2. Inflammation of periosteum,
3. Fracture of a tooth, pulp being exposed.
4. Dislocation.
5. Exostosis.
6. Nodules of Secondary dentine.
7. Idiopathic disease.
8. Impacted or crowded teeth.

The susceptibility of the pulp to irritation varies greatly in different persons, and at different ages, being greater in youth, a surrounding state of heightened sensibility exists which gave rise to the old notions, that aching teeth should not be extracted for fear of begetting neuralgia and increasing the congested state.

Acute Inflammation of the pulp, what Burns emphatically describes as the 'hell of all diseases' is a woe to suffer from. In the *chronic type*, local troubles may be void, but severe sympathetic pains in the head and face may exist. Even extending down the neck and to the shoulders, worse cases are yet narrated by Salter, which 'reflex disturbances are' as he says in quoting the *British Medical Journal*, "in keeping with the large bulk of nerve supplied to these organs, and the conditions for extreme irritation to which they are exposed, such as deafness, paralysis of the arm, wry neck, even the hair has been turned grey, trismus, epileptiform attacks and insanity have resulted." These and subsequent examples are mentioned, that such calamitous results may be corrected or avoided by timely extraction.

Persistent Inflammation of the periosteum may not only cause inconvenience, but render mastication a torture, eating on "caoutchoue douloureux" as Dr. Andrian so graphically describes it and the same author draws a distinction between the incisor and molar teeth for says he, in the former by an increased obliquity of the tooth allowance can easily be made for the hypertrophied periodontal membrane, but not so with the latter in which the act of occlusion becomes a con-

tinual source of irritation, the inflammation never thoroughly abates but with varying exacerbations, the primarily affected tooth becomes a local centre of spreading inflammation. And he further speaks of a peculiar gouty or diabetic type of periostitis for which he considers the only satisfactory cure, at least after 40, to be the one of extraction, though Mr. Rymer believes it to be generally amenable to the topical application of counter irritation and the internal administration of iodide of potassium. When the disease is clearly associated with struma or syphilis there need be no hesitation about removing any carious tooth, but with rheumatism their retention is preferable even should they be loose. Teeth containing a root filling incapable of being withdrawn, and the seat of an incurable periostitis will have to be removed. *General periosteal inflammation*, and *Pyorrhœa alveolaris*, and other chronic conditions necessitates extraction of teeth liable to be a source of irritation and failing to cure the involved teeth will have to be sacrificed.

With regard to *Fractured Teeth*, questions arise as to the person's age and extent of the fracture ; in the young the removal of a canine or lateral may be effaced by the approximation of the adjoining teeth, but the central would need more consideration, a tooth fractured in the direction of the root, through the pulp chamber or where but a small amount of root is left should be removed, in other cases pivoting or crowning (for all the teeth are liable), may replace the loss with serviceable members. *Dislocation*, *Replantation*, and *Transplantation*, cases where there has been severance of vital connections are sometimes followed by absorption, rendering the tooth tender and loose in its socket, then extraction is justifiable. In *exostosis* we have a troublesome disease, tooth after tooth has been removed in its treatment and many disorders, as epilepsy, changes in the colour of the iris, have followed.

Idiopathic disease of the pulp sometimes following attacks of scarlet fever may beget, from the poisonous properties developed, necrosis of surrounding tissue, (a condition also liable to result from carious teeth in strumous subjects), or a discolouration of the tooth renders the radical treatment necessary. The severe neuralgic pains attendant upon *impacted or crowded* teeth, caused by retained temporary, or deep situation in maxillæ, or abnormal direction of growth, necessitates judgment in removal. In the case of the wisdom

it may often be advisable to remove the second molar, a practice which may furnish us with such specimens of gemination as those for which the society is indebted to Mr. Jackson. In cases of a reflex trismus even to reach this tooth may be difficult, without the administration of chloroform. To relieve neuralgic pains any stump especially if it be on same side, showing signs of inflammation in the surrounding tissue, should be removed, and in confirmed cases, after removal of suspected teeth sound stumps should suffer the same fate as exostosis may exist, the cure is not generally immediate, first a heightening, then a gradual subsidence of the irritation. However, we must remember, as was recently pointed out by Mr. Baldwin a small remnant of nerve in one of these stumps may still linger in vitality.

2. *To prevent pain in the future.*

Perhaps we have here, more, a desire to maintain the best hygienic conditions of the oral cavity which may be either remote or near, for it is unquestionable that "all miserably painful and dangerously objectionable teeth should be removed as the only safeguard to the patient," for teeth rendered so useless by decay, are at any time liable to occasion disease in the parts about them; if unserviceable for any of our restorative arts, they should be removed, as also teeth which are extremely loose as in old age, or from enormous deposits of tartar. Again, mal or non-occluded teeth, we must bear in mind, are very liable to decay.

3.—*To relieve diseased conditions of contiguous parts.*

Speaking under this section of alveolar abscess, diseased antrum, and other conditions which may involve sacrifice of teeth. *Alveolar abscess*, many may be incurable, (due care being taken that there are not more roots than we are dressing), however prolonged, however assiduous be our treatment, where the tooth fang is denuded of its periosteum, bathed in purulent discharge, and acting as an irritating body tending to annulify that treatment, its removal becomes imperative, some dentists, however, can manage things with such a nicety of execution, such a delicacy of manipulation as to remove the apex of such a fang through the alveolus, and satisfactory healing results, however, such operators are not many, nor are the patients numerous who would submit to such

a treatment, and we should be on our guard with these abscesses, for they are most erratic products burrowing away, submining and exploring to such places as below the clavicle and into the brain causing the death of the patient. Not to speak of external facial disfigurement, often the result of home poulticing, when the removal of the offending organ would have relieved the trouble. The wisdom teeth are especially prone to start the most serious abscesses, the molars and lower incisors, surface disturbances, and the former in the upper also antral difficulties, discharge from the nose, may be from the upper centrals, the laterals generally manifesting infiltration into the palate. Alveolar abscesses sometimes become encysted, and the suppuration of neighbouring glands may prove a troublesome symptom, some cases having been accompanied by a discharge from the ear, and we may take it that when we have enlarged lymphatic glands, all teeth not admissible of being put into a healthy condition, should be extracted.

For access in treatment of *Diseased Antrum* any decayed tooth from the canine to the 2nd molar, (and especially liable are teeth in the molar region to be the cause of this mischief) or lacking decay we may signal out the first molar, but the method of entering by the fossa canina may be preferable to the latter.

Epuloid and other growths which are associated with the periosteal tissue, lining the tooth socket will require extraction, to obtain their complete eradication; and here I might mention the rare polypus of the pulp, which Salter compares to an "agaric" (that is able to lift a paving stone), as it will displace an inserted filling, such a tooth had better be removed, as it is unamenable to treatment.

Again, *parts contiguous* as the cheeks and tongue are sometimes brought to such a malignant appearance, that not infrequent cases of mistaken diagnosis have been made, and I have recently heard a case where a man was nearly losing his tongue, yet a complete cure was effected by the removal of a jagged edged lower molar. The wisdom teeth are a frequent trouble this way, from growing outwards or backwards, and to put the whole more tersely, "teeth should be extracted that cause, or are about to cause irremediable, painful or dangerous disease of the hard or soft parts. In *Necrosis*, teeth, or stumps contributing to irritation, should be at once removed; never mind the popular idea of waiting till inflammation has subsided. Sound

teeth, implicated by the necrosis had, however, better be left, as they may become firm in new sockets, built up around them. Again, teeth in fractured jaws should be allowed to remain on the same ground unless they themselves are fractured.

4. *To anticipate, or obviate irregularity.* The acquired character of our shortened and contracted arch, be it from the modern arts of cookery, or from whatever cause, presents a marked contrast to the squarish expansion, now almost a theoretical, but in the past ages, and amongst less civilized humanity, the characteristic type, still we retain those thirty-two dermites, but no longer is there that space for their normal arrangement; nature here attempts corrections, some teeth may be attenuated, some may even cease to be erupted, the essential removal from amongst these series gives that space which nature requires, and uniformity demands. A question then arises, are we justified in anticipating *hereditary results*, especially when members of the same family already show such transmission of irregularity dependant upon a crowded arch. Mr. Tomes favours this view, for in such families he recommends the premature extraction of the first bicuspid by a removal of the temporary molar. However, such surmising is not supported by other writers, for we are unable at present by any law, to affirm that displacement will occur in every member of the family. However marked be the tendency, they consider it advisable to wait till the age of 12 to 13, when the symmetrical extraction of a decayed molar, or if the articulation be bad, the premolar may be an aid to, or a correction of the deformity. If the case be not taken at this age, it may be advisable to wait till the eruption of the wisdom tooth, but Kingsley condemns as 'bad practice' when mechanical treatment is also to be adopted the extraction before we adjust, or immediately contemplate adjusting such appliances. Our correction in these cases being of course governed by the effect it would have on the external features, remembering also "that expansion, and retention of the whole number of teeth, is only good treatment where the teeth are of fairly good quality."

Other typical irregularities, as a protruding arch may require preliminary extraction. Some observers have expressed an opinion, that there is a backward movement of the 6 anterior teeth, with the reverse in the back ones. Whether this may place drawbacks to our treatment, I cannot say.

Teeth excluded from position in an otherwise normal arch,

and which may be a source of irritation or disfigurement, we should remove, often is this the case with the lower *incisors*, of which the loss of one would be unobservable. Also in males where an upper central and canine are approximated with a lateral behind "it is better to extract the malposed tooth than disturb the whole arch to bring it into position." This is quoted from Kingsley, amplified by being printed in italics, but with the female sex, who cannot hide their teeth behind a "hirsute" covering, other questions may alter such a decision. The proximity to a decayed molar or premolar should in certain cases, however, again divert our attention.

Other teeth liable to displacement as the *premolars* should be extracted, even if our patients should like Mr. Hooton's cornet player, bring on them their neighbour's wrath, by the capability then possessed of reaching some "wonderfully high note," for we must guard against approximal decay.

Outstanding *canines* are sometimes treated by the removal of a bicuspid, generally, however, the extraction of the second temporary molars, or when much decayed and in a crowded arch the 6th year molars. Another irregularity to which Mr. Tomes alludes, as requiring extraction is a condition in which the cutting edge of the lateral incisor is made to stick out by pressure of the developing canines upon its apex, in this case he says, "the rule of not extracting the temporary canines should be broken through, and if this appears insufficient to allow the canines to get back the first bicuspid, unless such a course may be otherwise contra-indicated, may be extracted.

Supernumerary and supplemental teeth present in the arch, should at an early age be removed, if in after years the question occurs, their retention may be preferable to a probable gap. Those situated out of the arch should all be removed.

5. *To prepare the mouth for the reception of artificial teeth.*

This the last, yet the all important practical section of my subject, and the one in which our ideas of beauty can be so deftly developed, for cannot we mar or enhance facial expression. Let us work for art by all means, yet, in so doing we must not sacrifice the interest of our patients, and therefore teeth incapable of being brought into a healthy condition, stumps the seat of periostral troubles, loose or necrosed, had

better be removed. Some even would be more radical and remove all, saying not only may they be liable to irritation under a denture, on account of the difference in resistance offered between them and the surrounding tissue, but a section denture with a more equal resistance adapts itself better, however, we must bear in mind, the considerable deformity which is associated with their loss. But with the anterior teeth, it is far more preferable to excise fitting the teeth down on to the stumps, or better still these teeth are more naturally supplied with crowns, a method also applicable when there are but one or two teeth in the molar series whose extensive carious surface requires much remodelling, by these means the natural gum line is maintained, and artificialism concealed.

In concluding this chapter of extraction, I thank you for the bestowment of some little time to its reading, and trust that in the discussion, with your greater experience, you will make more definite the ideas embodied in this essay, that it shall not only be of benefit to ourselves, but to use the words of a recent article, "make the application of reason to the operation," one of interest and importance.

RHINOLOGY.

PAPILLOMA OF THE INFERIOR TURBinate BODY.—Dr. Noquet (*Revue de Laryngologie*, June 1st, 1891), reports a case of papilloma springing from the posterior end of the left inferior turbinate body. It occurred in a man, aged 49, in whom there was a history of obstruction of the left nasal passage for several years. The tumour could be seen with the rhinoscopic mirror occupying the lower part of the left choana, and having the appearance of a raspberry. It was attached by a somewhat broad pedicle to the posterior end of the inferior turbinate body. M. Noquet removed the tumour with the cold snare, and freely cauterised the point of origin with the galvano-cautery. He remarks on the rarity of true papillomata in the nose. Certain authors, like Hopmann, Schech, and Schäffer, who describe them as common, evidently include under that designation every growth having a papillary appearance, such as angiomata, adenomata, and papillary sarcomata.

British Journal of Dental Science.

LONDON, AUGUST 15th, 1891.

TEST EXAMINATIONS.

WHAT is liberty? It is easy enough to answer:—It is a state of exemption from control, a state in which one can follow one's own will without considering, or being influenced by any other consideration, person, or thing. If such a state be a condition of freedom for the one man, it is one which must enforce a bondage on others. If the one is free to do what he likes, it follows that all others are subject to him, are in a condition of slavery. So it happens that the highest state of freedom or liberty may be coincident with the greatest restraint. Freedom to do what a man will with himself, but absolute restraint when what he does affects another. But what can a man do that does not affect another? So interwoven are the affairs of men that none are without some tie which renders their actions of influence for good or evil on another. Take such an innocent example as playing a musical instrument. In this free and happy land a man may play the whole night long, the loudest, most inharmonious, ill-executed composition, though on the other side of the dividing wall of his jerry-built house another may be trying to get the few hours repose which fit him to carry on his duties as bread-winner. In other lands the hours during which a man may try his skill, or lack of skill, in such a way, are strictly limited. We ask:—Which condition is the one of more perfect liberty?

Now when a man talks of the need of liberty in a profes-

sion, of the desirability of practice being devoid of control, these general considerations, which we have just touched upon, make one look somewhat askance at his propositions. So when a man says, "medicine itself ought to be a free profession," as does Ed. Isambard in a letter to *Le Progres Dentaire*, (see our last issue under "French Dental Journals"), we would again ask:—What is meant by being free? The whole letter appears to us to be written on the assumption, all too frequently made, that a man's doings affect none but himself. It would be easy to show, at much greater length than we have attempted in the previous paragraph, the absolute falseness of this idea. Take one of Dr. Isambard's statements. "Between the dentist and his client private interests alone are at stake." This is not true, leaving aside the fact that the health of one member of a family affects the other members, the above sentence reads as if the dentist had only one client; if this were so, the interests at stake would certainly be very narrow, but a man in his professional or business capacity is a public man. His circle of clients are the public, and the interests at stake are not private, but public. Say that the man is a dentist. In all but a few cases, he makes some public announcement of this. Guided by this public profession of skill the public consult him. Being ignorant on these points themselves, they cannot appreciate whether his advice is good or bad, his statements true or false. Grant that they are both good and true, then all is well, but suppose they be both bad and false, we ask is the client a free agent? The dentist makes a public profession, which in this case is false, influenced by this, bound by this, the client places himself in the dentist's hands. Is the client a free agent? A public announcement is made, the government, who rules (or is supposed to do so) for the common good, allows it, trusting in this the public seek advice. Are they free agents?

Look at the question from another side. A man makes a public profession of some calling, the government insists, or, as we think, should insist, that it has a right to know if his

profession is *bona fide*, if he can do what he says. Wherein is the restraint? No one obliges him to make this profession, but if he does then he should be qualified to make it. He is merely prevented from publicly lying. Is not this the highest liberty? Attack the method of testing, attack the method of teaching enforced, these are argumentative matters, but to say that a man, under the name of freedom, shall be allowed to publicly perjure himself,—Is it not a little too absurd? Not in so many words, but in substance, Dr. Isambard asks :—“ Would you follow this theory to its logical conclusion? Would you have a test imposed for each calling? We would. In olden days the thing was done almost unconsciously. The various trades were distinct. There was no entrance to one, save through a long apprenticeship, the prentice lads were a feature of the town, and the fact that they were in so-and-so’s workshop, was a guarantee of proficiency. Now this has been done away with, and in the freedom that followed comes the false liberty of misrepresentation. Is dentistry, the medical, or the attorney’s profession such a poor thing, that they shall straightway lose all honour and status, because other callings also cannot be followed without passing a test of proficiency? We are of opinion that these professions maintain their position on no such negative grounds. The tests which in old days were imposed by the master on his prentices has become impossible, by reason of the great increase in population, and the freedom which reigns in allowing liberty of action as regards following a calling. If however, this is to the disadvantage of the public, government steps in and imposes a test examination, usually appointing some authority to carry this out. We cannot, therefore, see the logic of Dr. Isambard’s sneers at the bare idea of hair-dressers, chiropodists, and so on, having a test examination imposed on them. Surely it is the very thing that is required, not for them only, but also for the mechanic, the carpenter, the plumber, and so on. As regards social status, this does not depend on the test ex-

amination, but on the merits of the men who follow the calling, and there is surely nothing more illogical, not to say snobbish, than for any set of men following the same calling to assume that social distinction descends down the scale until it reaches them, but that beneath them a great gulf is fixed. Many are prone to do this, not only in private, but in public, and we can only hope that the dental profession, whose merits are only just gaining public recognition, will not blurr its character by any such narrow-minded nonsense.

A WHOLESOME dread of the lancet (the instrument, not the Journal), is no doubt most desirable. It is not well to cut and bleed promiscuously. But just as it is possible that the old remedy of bleeding may now-a-days not be frequently enough resorted to, so, in dental surgery, it is possible that there may be too great a reliance placed on drugs and dressings, and too little trust be placed in making an incision. It is, of course, absolutely wrong to leave a pulp canal full of decomposing *debris*, and endeavour to allay the perioritis by incising the gum ; but, surely, it must be equally wrong to endeavour to drain and cure an abscess through the fine opening such as the apical foramen. It is a violation of the first principle of surgery :—free drainage. A case will be found under the German Abstracts in which the dental surgeon, though he could get pus to flow through the apical foramen ; though there was a distinct swelling increased markedly when fluid was injected up the pulp canal, yet he would not make an external incision through the gum. What was the result? Death of the pulp in a neighbouring tooth. And what else could be expected?

A STORY hails from Wilmington, which is interesting. It is said that William H. Dexter, an oysterman, exhibited at the office of the *Wilmington Messenger*, quite a curiosity, which he took from New River, near Cedar point, in Onslow county. It was two oysters fastened together at right angles, with a set of false teeth adhering to them at the intersection

of the shells. The upper roof of the teeth was next to the shell, while the teeth were pointed outward. The teeth and gums were in a perfect state of preservation, although it is conjectured that they have been in the bottom of the river for some years. The oystermen say that the oysters to which they were attached are of about three years' growth, and a dentist says that the teeth are of a style made thirty years ago, although a few of the same style are yet made by some doctors.

THE total amount of the Hospital Sunday Fund available for distribution amounted to £43,157 15s. 4d. The following are the awards:—*General Hospitals* (twenty-two).—Charing-Cross Hospital, £1083 6s. 8d. ; French Hospital, £227 10s. ; German Hospital, £704 3s. 4d. ; Great Northern Central Hospital, £325 ; Guy's Hospital, £541 13s. 4d. ; Italian Hospital, £97 10s. ; King's College Hospital, £1462 10s. ; London Hospital, £3250 ; Metropolitan Hospital, £433 6s. 8d. ; Miller Hospital and Royal Kent Dispensary, £303 5s. 8d. ; North West London Hospital, £325 ; Poplar Hospital, £227 10s. ; Royal Free Hospital, £975 ; St. George's Hospital, £1625 ; S.S. John and Elizabeth Hospital, £130 ; St. Mary's Hospital, £2220 16s. 8d. ; Seamen's Hospital Society, £758 6s. 8d. ; The Middlesex Hospital, £3058 6s. 8d. ; Training Hospital, Tottenham, £325 ; University College Hospital, £1310 16s. 8d. ; West London Hospital, £606 13s. 4d. ; Westminster Hospital, £1083 6s. 8d. ; London Temperance Hospital, £498 4s. 8d.

Special Hospitals, Dispensaries, etc.—Five Chest Hospitals, £3553 6s. 8d. ; twelve Children's Hospitals, £3650 16s. 8d. ; four Lying-in Hospitals, £525 8s. 4d. ; six Hospitals for Women, £1608 15s. ; twenty-four other special hospitals, £3773 1s. 9d. ; twenty-one Convalescent Hospitals, £3263 6s. 8d. ; twelve Cottage Hospitals, £473 8s. 4d. ; nine miscellaneous institutions, £1110 8s. 4d. ; fifty-seven dispensaries, £2460 5s.

Abstracts of British & Foreign Journals.

THE DISINFECTION OF DENTAL AND SURGICAL INSTRUMENTS.

By W. D. MILLER, M.D., D.D.S., Berlin.

ASEPSIS and antiseptis form the rock upon which the edifice of modern surgery is founded, and in virtue of which it has registered triumphs in the treatment of diseased conditions of the human body formerly unattainable.

The wonderful progress which has been made by surgery in the last ten years is the legitimate fruit of the growing knowledge of the part performed by microscopic organisms in spreading disease, and of the methods of counteracting or preventing their action.

The necessity of aseptic and antiseptic procedure in all operations in dental or general surgery is to-day, we may say, universally recognized. It is true that there are still some whose appreciation of their duty toward those who commit themselves to their care is so stunted that they insist upon the right to spread infection by unclean instruments or fingers that are not absolutely free from germs. Fortunately, however, such men are rapidly becoming fewer, and will not be able to hold out long against the just condemnation of an advancing profession.

Antiseptis is but one of the means to the production of asepsis. It should be the aim of every surgeon to perform all operations aseptically, and he who comes nearest to attaining this ideal will be more successful than he who lays the chief stress upon the subsequent antiseptic treatment.

If we wish to protect ourselves against robbery, it is a hundred times better to keep the thief out by appropriate locks than to allow him to enter by the open door and then take the chance of a conflict, in which we may possibly be worsted. When, however, the surgeon who uses the most scrupulous care in cleansing the part to be operated upon, his hands, towels, instruments, etc., before every operation,—*i.e.*, operates aseptically, and accomplishes results proportionate to

his care,—disclaims the use of antiseptics, he is deceiving himself, for the reason that the very means used to bring about the aseptic condition—soap and brush, pure water, etc.—are themselves antiseptics. He is simply accomplishing by those simple means that which he, in most cases at least, might better and more easily do if he would take advantage of the most powerful means of sterilization.

There is no department of surgery in which the demand for antiseptic procedure is more urgent than in dentistry, for the reason that all of our operations are performed upon septic or infected tissues, and we have no means of rendering the territory to be operated upon aseptic except by the use of antiseptics of the highest character. We cannot extract a tooth, cleanse the canal of a pulpless tooth, excavate a cavity of decay or lance the gums : we cannot even touch any point in the oral cavity without our instrument becoming coated with a layer of infectious material. We are therefore bound to use antiseptics, not only for the purpose of disinfecting the already infected tissues, but for sterilizing our instruments to avoid the transmission of infectious matter from one patient to another.

It is the use of antiseptics for the latter purpose which I have made the subject of a series of experiments to be described.

The necessity of absolute cleanliness on the part of the dentist, of his hands as well as his instruments, napkins, drinking-glasses, rubber-dam, in short, of everything with which he comes in contact with the patient's mouth, is universally recognized ; at least there can be no one who has the courage to express a contrary opinion. And yet it is not at all difficult to find persons in the practice of dentistry who neglect this matter to an extent that is revolting to the taste and dangerous to the health, and it is anything but creditable to the dental profession that the proposition has been repeatedly made, to have the state of the dentist's instruments inspected from time to time by a health officer. Only a short while ago a surgeon, who fully recognizes the necessity of proper care of the teeth, made the statement that he had been obliged to allow his own to go to ruin because the uncleanness of the dentist in the place where he resided was so great that he could not run the risk of an infection by his instruments.

That many people shun the dentist for no other reason than

the above there is no doubt. It is to be hoped, however, that the number of dentists who still lay themselves open to the charge of uncleanness is small, and that they will take care to wash this opprobrium from their hands.

I need not refer in particular to the æsthetic aspect of the question, or picture the feelings which a refined, sensitive lady, or indeed anyone of a cleanly habit, must experience on having rusty or unclean instruments and soiled fingers plunged into her mouth. This is a matter which is to a certain extent self-regulating, in that those who have an appreciation of cleanliness will very soon find their way to more congenial hands.

In regard to the possibility of transmission of disease by dental instruments, there have been so many cases reported in dental and medical journals that the matter should be familiar to every practitioner of dentistry. I may call attention, however, to the large number of cases (some forty) reported in my book (*Micro-Organisms of the Human Mouth*," pages 248, 274, 338), in which infections of various nature, including septicemia, pyemia, meningitis, and syphilis, followed operations in the mouth; also to the cases reported by Parker,* in which a whole family was affected with syphilis through the extraction of a tooth; finally to two cases which recently occurred in Berlin, in one of which syphilis, in the other septicemia followed tooth-extraction.

Anyone who examines carefully into the question will have no great difficulty in finding scores of cases of this kind, notwithstanding the fact that the great majority of them are never published. Of course the cases where infections of a less serious nature occurred are much more numerous.

It is a very fortunate provision that the gums, in a healthy state, offer so powerful resistance to the invasion of the germs of *most infectious diseases*. For this reason a wound in the gums may be followed by scarcely any reaction whatever, while a similar wound on the hand with the same instrument may produce most disastrous results. It has been attempted to account for this fact on the *supposition that the saliva had an antiseptic action*, in evidence of which we are often reminded that dogs lick their wounds, and that these heal rapidly. It is scarcely necessary to say, however, that

* *Western Dental Journal*, February, 1890. See also Bulkley, "On the Dangers arising from Syphilis in the Practice of Dentistry."

reasoning of this kind, based upon a comparison of the strongly alkaline saliva of the dog with the neutral saliva of the man, is inadmissible. Others attribute, with more show of reason, the comparative immunity of the lower front teeth from decay to an antiseptic action of the saliva ; but since the lower molars are decidedly more subject to decay than the upper, they are obliged to restrict the antiseptic action to the secretion of the sublingual and submaxillary glands, which they assume to bathe only the front teeth, and to come, not at all, or very little, into contact with the back teeth. These assumptions, besides being rather gratuitous, lead us into a dilemma when we attempt to apply them to other infectious diseases of the human mouth ; for instance, pyorrhea alveolaris, which shows a preference for the lower front teeth.

I doubt if there is anyone who would wish us to believe that the dead saliva has even the slightest antiseptic properties, in consideration of the fact that the saliva, especially when it contains much organic matter, very readily putrefies. If the saliva possesses any such property, it must be sought for in its living histological elements, *i.e.*, in the living leucocytes or "phagocytes." Since these are furnished chiefly by the tonsils, it follows that they should afford their protection most of all to the lower molars, with which they first come in contact. If such were the case, we should hardly expect the lower molars to be the most liable to decay of all the teeth in the mouth. Besides, on the whole, it does not well harmonize with our views of what constitutes an antiseptic to apply this term to a liquid in which processes of fermentation are constantly going on. Finally, it is a very well known and universally recognized fact that wherever an infection has been brought about by an unclean instrument, by a bite, etc., the most active antiseptics must be resorted to in order to check or prevent a general infection. There certainly could be no hope of accomplishing this end by application of a substance whose antiseptic action, if it has any at all, is so weak that no one has as yet been able to detect it.

I therefore attribute the fact that wounds in the mouth heal so rapidly, exclusively to the recuperative power of the parts, a view which is supported by the observation that where this power is lost, putrefactive processes may make most fearful ravages, as seen in cases of noma, stomacace, stomatitis scorbutica, stomatitis mercurialis, etc., notwithstanding the fact

that these diseases are always accompanied by an increased flow of saliva.

It is consequently never safe to trust to the usually pronounced immunity of the gums towards infections, since they, under many abnormal conditions, lose their power of resistance altogether ; and more than this, the mucous membrane of the mouth appears, *under all conditions* when slightly wounded, to furnish ready entrance to the germs of syphilis, if not to those of tuberculosis, diphtheria, etc.

We can never know what virus may be clinging to our instruments, nor can we with certainty predict the result of a wound upon the gums, cheeks, or lips with an unclean instrument. The case of the Amsterdam physician, who died from an infection caused by lancing the gums, should be a warning to us.

It is therefore our duty to our patients, to ourselves, and to our profession to see to it that the possibility of conveying virus from one mouth to another during dental operations is excluded with absolute certainty. It also stands to reason that in all operations upon the jaws and teeth we should, as far as possible, sterilize the field to be operated upon, since the danger of infecting the pulp or pericementum, or of producing a general infection through the germs in the patient's own mouth, is always present. This point, however, will be considered more fully on another occasion.

METHODS OF STERILIZING INSTRUMENTS AND ACCESSORIES.

Napkins

become sterilized by the boiling process to which they are subjected in washing.

A napkin which was badly soiled with blood and mucus from the mouth was cut into a number of small pieces and placed upon the surface of a plate of agar-agar. In no case in which the boiling was continued for ten minutes did any development of bacteria take place, and generally the pieces were found to be sterile in six minutes. We may therefore safely say that boiling for ten to fifteen minutes in soap-water furnishes a certain means of sterilizing napkins.

Coffer-dam

is a most fertile means for conveying infection from one

mouth to another, and the number of germs I have found on pieces of rubber supposed to be well cleansed was surprising.

Small pieces of rubber-dam can be sterilized, as a rule, by exposing them for thirty minutes to a five per cent. solution of carbolic acid. It would not be safe, however, to count upon a perfect sterilization of large pieces such as we use in practice in less than two or three hours, and then only when the whole surface of each piece is freely exposed to the action of the antiseptic. The same object may be accomplished in about one-tenth of the time by boiling water.

Personally I never use the same piece of coffer-dam twice under any circumstances. The only excuse for doing so is the cost of the material; but by properly cutting we can get a piece large enough for the incisors and cuspids for one and one-half to two cents, for the bicuspid for two to three cents, and for the molars for three to four cents in the upper jaw; for the lower jaw add one cent to each category. The plea that the expense would be too great is therefore altogether illusory, because there is not, I venture to say, one practice in a hundred which will not remunerate the dentist a hundred-fold for this slight expenditure, since there is nothing about which patients are more sceptical than the subject of coffer-dam, and nothing which they appreciate more than a fresh piece for every operation.

Where, however, the necessity exists for repeatedly using the same piece of rubber-dam, boiling water is the proper, and, in fact, the only safe antiseptic that can be made use of.

Small pieces of rubber were, with very few exceptions, found to be completely sterile after boiling for six minutes. In practice, larger pieces should be boiled for fifteen minutes.

Drinking or rinsing glasses should be sterilized by boiling in pure water.

Instruments.

The question of the disinfection of surgical instruments is one which has given both surgeons and bacteriologists much to think and work upon, and only recently can it be said to have approached a definite solution. The method of sterilizing instruments by dry heat requires so much time that its application to dental instruments is out of the question.

The ideal antiseptic is a liquid which acts immediately upon bacteria without in any way injuring the instrument. While it might appear that quite a number of the antiseptics at our command would meet this requirement, it is in reality not the case. There is a vast difference between sterilizing liquids and sterilizing solid bodies, and an antiseptic which sterilizes a drop of water brought into it almost instantaneously may require a quarter of an hour or more to sterilize a solid body, particularly when it is coated with a layer of dried albuminous material, as our instruments are liable to be.

In order to test the efficiency of various antiseptics in sterilizing instruments, I have adopted the following

METHOD OF PROCEDURE.

Small cylindrical pieces of glass about 5 mm. in diameter and 4 to 8 mm. long were brought into a vessel containing a number of freshly-extracted teeth, and a few drops of water added. Here they were stirred about with a glass rod, so that they became coated with infectious matter. They were then dried at room temperature for twenty-four hours, or for two or three hours at blood temperature.

A number of them were then placed in a small sterilized glass vessel, covered with the liquid whose sterilizing power was to be tested, and a somewhat larger glass vessel placed over it, after the manner of a bell jar, to avoid the possibility of germs falling in from the air.

At given intervals the cover was lifted and a glass cylinder removed with sterilized pliers, washed in a small stream of sterile water, and conveyed to a tube of bouillon, which was then put into the incubator and kept at a temperature of 35° to 37°. If the bouillon remains clear for twenty-four to forty-eight hours we have evidence that the piece was sterile; if it becomes cloudy, we know that the contrary is true. We are accordingly able in this way to determine how much time is necessary for sterilization by different antiseptic solutions.

Naturally great precautions are requisite to avoid errors of experiment. We must be absolutely sure that every thing used, particularly the pliers and the rinsing water, is free from living germs, excepting of course the infected piece to be acted upon. We must also avoid coming into contact with anything on the way while conveying the glass piece to the tube of bouillon. It is advisable to especially prepare the

culture-tubes by pushing the cotton stopper into the tube about half an inch beyond the mouth, and holding the mouth in a gas flame until the cotton becomes slightly charred, then drawing the cotton out with sterilized pliers, so that it may be readily grasped with the fingers. The object of this is to sterilize the mouth of the culture-tube, so that if we come in contact with it with the glass cylinder there will be no danger of the latter becoming infected thereby.

Other precautions which will suggest themselves to the bacteriological reader may not be referred to in detail.

I have satisfied myself by a large number of control experiments that there is no danger, on the one hand, of carrying over to the culture-tube so much of the antiseptic as to prevent the growth of such living bacteria as may still be present : nor, on the other hand, of an accidental infection by air germs, provided the experiment is carried out with proper precautions.

Besides glass cylinders I have made use of leaden bullets, shot, peas, and roots of teeth after filling the canals with cement.

Furthermore, in my later experiments I have used a pure culture of one of the most resistive bacteria found in the mouth, instead of decayed teeth for coating the glass cylinders, since we thereby obtain a more uniform coating, and consequently more uniform results.*

Tests were made with the following substances :

Carbolic acid in five per cent. aqueous solution and in pure form.

Lysol in five per cent. aqueous solutions.

Trichlorophenol in five per cent. aqueous solutions.

Sublimate in five per cent. aqueous solutions, also in the strength of 1 to 1000 water.

Benzoic acid in the strength of 1 to 300 water.

Potassium permanganate in five per cent. aqueous solutions.

Resorcin in ten per cent. aqueous solutions.

Hydrogen peroxide in ten per cent. aqueous solutions.

Saccharin in concentrated alcoholic and aqueous solutions.

* I have used glass cylinders, bullets, &c., in these experiments simply because they are much more convenient to work with than instruments.

I gave them a coating of infectious material, not because our instruments are supposed, in practice, always to be in this condition, but because they *may be*, and I am afraid sometimes are, and our methods of sterilization should be sufficient for all cases.

B-naphthol in five per cent. alcoholic solutions.

Pyoktanin in concentrated aqueous solutions.

Absolute alcohol.

Antiseptin in five per cent. aqueous solutions.

Sulphite of zinc in concentrated aqueous solutions.

The essential oils in five per cent. emulsions and in pure form.

Cosmos.

(To be continued.)

TO PREVENT DARK JOINTS.—Grind the joints as true as possible without bevel. Wax up and flask in the usual way. When ready for packing, lay a strip of white rubber behind all joints, observing the utmost care in maintaining cleanliness throughout all the details; the result will be more permanent and satisfactory than where plaster or oxyphosphate is packed between the joints. The latter substances prove an element of weakness to the plate, and must ultimately disappear by solution.—OTTO ARNOLD.

Cosmos.

Dental News.

EDINBURGH DENTAL HOSPITAL.

The half-yearly meeting in connection with the Edinburgh Dental Hospital and School was held in the Board Room, Lauriston Lane—Dr. Peel Ritchie presiding. The report stated that the session had been, on the whole, a satisfactory one. The number of students on the roll had been the same as the previous year, and the students had not been behind in any medical classes. It was reported that Mr. John Malcolm had gained the senior prize, Mr. J. M. Macgregor the prize in the junior division, Mr. Murrey Thomson the medal in dental anatomy and physiology, Mr. Thos. Nash the medal in dental surgery and pathology, and Mr. J. D. Shep-

herd the medal in dental mechanics. With regard to the hospital work, 4157 patients, it was stated, had been treated, of which 1473 were stoppings and 2638 extractions, and the numbers compared favourably with those of the same period last year. The report was adopted.

ROYAL COLLEGE OF SURGEONS EDINBURGH.

During the July sittings of the Examiners the following gentlemen passed the First Professional Examination for the Licence in Dental Surgery:—William Williams, Beaumaris, Alexander Henderson Bain, Galashiels; and the following gentlemen passed the Final Professional Examination and were admitted L.D.S. Edinburgh:—Andrew Kinsman Brittan, Plympton; Samuel Arthur Westerton, London; Thomas Watson Morton, Cumberland; George Samuel Bonnalis, Chester; David Wilson, Edinburgh; and Robert Keith Common, Edinburgh.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

CEMENTS FOR THE TEETH.

To the "Editor of the British Journal of Dental Science."

DEAR SIR,—On P. 709 of your last issue I note the following, "I have analysed two cements which have been placed in the market, (Fletcher's and Weston's) their resemblance may possibly show another case of independent discovery in different countries" The writer evidently is ignorant of the fact that Weston's cement appeared for the first time long after my own, and this "independent discovery" at second hand, may bear another name. In the analysis of Weston's 80 per cent. of the solid is said to be inert, in my own there is certainly no inert matter.

Yours, &c.,

THOS. FLETCHER.

Warrington.

British Journal of Dental Science.

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DENTAL REFORM IN THE NAVY.*

By GEORGE CUNNINGHAM, M.A. (Cantab), D.M.D. (Harvard),
L.D.S., England.

THE Medical Department of the Navy is concerned with the medical, surgical, and hygienic treatment of some 60,000 men. It is an obvious axiom, therefore, that the Department is responsible both for the surgical and hygienic treatment of the teeth of the men under its charge. A defective condition of the teeth is a recognised cause of impaired digestion and consequent loss of health ; and disease of the teeth and surrounding structures must be regarded as a direct and more or less frequent cause of inefficiency and unfitness for active service.

No amount of admiration for the Department, which has done so much to extend the benefits of modern achievements in medicine, surgery, and hygiene to the men under its care, can shut the eyes of the dental practitioner to the fact that it has hitherto neglected to give them the advantages derivable from the improved methods and practice of that branch of medical science known as dental surgery, except in such a way as to endorse our contention for the logical extension of this kind of treatment to the whole service.

This subject has received considerable attention at various meetings of the British Dental Association for some years past. The Association has printed at considerable expense exhaustive papers on the subject and distributed them to the various authorities. In accordance with a resolution unanimously passed at the Annual General Meeting in 1887, its

* Read in the section of Naval and Military Hygiene, Seventh International Congress of Hygiene and Demography.

Representative Board memorialized the Lords Commissioners of the Admiralty, but all without effect. I, therefore, venture to ask your favourable consideration for certain facts, which have received the endorsement of so important and representative a body as the British Dental Association as well as the approval of individual officers of the service.

The age of the majority of those entering the navy is from 15 to 16½ years. The 12 years' service, in conjunction with the period of preliminary training (2 years) and the possible further extension of 9 years constitute a long period of service which contrasts strongly with the short service now adopted in the army.

The Royal Marine service is under the care of the Navy Medical Department. The age of the recruits for this service is from 18 to 24 years. The period of service is for 12 years, with the option of serving an additional 9 years if their conduct is good. Artificers, too, are subject to much the same regulations.

The recruiting examination, as far as the condition of the teeth is concerned, is infinitely more strict for the navy than the similar examination for the army. The memorandum issued for the guidance of recruiting officers by the Admiralty is well worth earnest consideration.

“MEMORANDUM for the GUIDANCE of RECRUITING OFFICERS.”

Admiralty, February 2nd, 1882.

“(a) The loss of five teeth, absent or unsound in any degree must in all cases be considered a cause for the rejection of boys.

(b) If the biting or grinding capacity be seriously impaired by the loss of a less number of teeth than five, for instance, three or four incisors, or three or four molars in the same jaw, the boy must be considered unfit.

(c) Beyond the above, no exact rule with respect to defective teeth can be laid down to the examining medical officer, but he should take into account the condition of the teeth generally, and the probability of their lasting.”

I understand that this memorandum is still in force, with the exception that for the London District the Admiralty has extended the number of absent or defective teeth which disqualify the candidate from five to seven.

There can be no doubt that this extension of the number of

absent or defective teeth to seven was imposed by the difficulty of finding a sufficient number of recruits who satisfied the higher standard as to the condition of the teeth.

With regard to paragraph (a) it would be interesting to know since the teeth are symmetrically disposed in the jaws both in position and number, which is the odd tooth or teeth with which the recruit can dispense.

Paragraph (b) is good in so far as it insists on biting or grinding capacity irrespective of the number of teeth present but the terms in which it is expressed, especially as regards the incisors, is not instructive and indicates a small acquaintance with the clinical aspect of dental caries.

Paragraph (c) is a proof of the opinion of the authorities as to importance of sound teeth to the sailor. It is surely, therefore, short sighted on the part of the authorities to assume that the examining medical officer is necessarily possessed of the knowledge requisite to estimate the condition of the teeth generally and the probability of their lasting.

That these regulations are not consonant with the views of the dental experts may be easily shown. The late Mr. Spence Bate, F.R.S. in a Presidential Address to the Odontological Society, while discussing the Admiralty regulations as to the teeth of the boys entering the navy, said: "Thus occasionally six teeth and not unfrequently four, might be judiciously removed with advantage to the future healthy condition of the mouth and the permanent utility of the teeth improved, even eight or twelve teeth might be removed from the mouth and the person gain by the loss, while on the other hand four teeth only might be lost and the set made weak as a masticating organ."

Mr. Bate's view as to the twelve teeth would probably only hold good in extreme and exceptional cases, but we can only emphasize the truth of his statement as to the loss of eight teeth in many cases; and of four in most.

It is a well recognized fact in dentistry that owing to extensive caries of the first permanent molars, which are usually neglected under the misapprehension that they are only temporary teeth, the extraction of these teeth if performed at the proper time, promotes instead of deteriorating the efficiency of the denture in mastication, and frequently diminishes the liability to caries by relieving the remaining teeth from undue lateral pressure.

Mr. Fisher, whose name is identified with the plea for the

compulsory attention to the teeth of school children, remarks : " This dental standard of the Royal Navy for boys of 16 years or so is not by any means too severe, when one thinks of the likelihood of their being sent on foreign service, or, in times of warfare, for cruises of three, four, or five years ; for one observes the necessity for selecting physical types that will endure the tear and wear common to such a life, where the foods are all more or less hard. What the Admiralty ought to exact is that no boy be received with decayed or decaying teeth, not even one tooth, as this disease is now as amenable to treatment as any other. Then, if so, why should they take boys with any decayed teeth, when the weak places may be made strong by fillings, &c. ? Many healthy, strong boys with more teeth decayed than would at present disqualify them, would then be eligible for the service, and would prove equal to, if not surpass, their present selection."

In illustration of Mr. Fisher's contention, I would mention the following case :—A lad having been rejected for the Royal Navy in consequence of defective teeth, I examined the case at the request of the recruiting officer and formed the opinion that all the defective teeth could have been restored by means of conservative treatment. On inquiring if he would be justified in forwarding the lad for re-examination if his teeth were put in proper order to the satisfaction of the recruiting officer and of the medical officer, who might re-examine him, the reply of the staff surgeon was, "It is no use sending this boy again as the grinding capacity of his teeth is impaired."

I must leave the relative value of these two diverse opinions of the staff surgeon and the dental practitioner to your consideration. Suffice it is to say that I did put the lad's teeth in order, which were only carious, with a view to practically testing the question, and with the exception of one upper and one lower molar he again had practically a perfect denture.

A great deal of unnecessary expense is incurred by sending up lads for examination at headquarters, which might be obviated by employing the local dental practitioner to make an examination of the teeth of recruits in the same way as the civil medical practitioner is employed.

If competent dental advisers were attached to the Admiralty Recruiting Department, I am convinced that they would soon be able to prove to the satisfaction of the authorities that they would gain by increasing, rather than diminishing, the stringency which is enforced as to the teeth of the recruits,

while, with efficient means which can be readily provided for the conservative treatment of the teeth, there might be a great extension of the number of available candidates. Nay, more, I am in a position to prove not only the truth of this statement, but also that the authorities themselves are in the possession of the facts, though they fail to adopt the logical sequel arising therefrom.

In December, 1885, the Admiralty entered into a contract with the authorities of the Dental Hospital of London, by which the latter in consideration of a subscription of 30 guineas, undertook the dental treatment of such recruits as might be referred to them during one year, and, as a consequence, 34 marines, 14 boys, and one artificer were so treated. The Recruiting Department was thus enabled to add this number of desirable and in other respects efficient candidates, who would otherwise have been prevented joining the Royal Navy and the Royal Marines solely on account of the defective condition of their teeth.

Unfortunately, the hospital authorities have kept no separate account of the professional services rendered under this contract, and the Admiralty authorities who might give the requisite information refuse to do so. I have, however, sufficient data in the following figures, which I have been able to gather with regard to the amount of work done in the year 1888, to prove that the amount of service has been very considerably increased.

RECRUITS treated at the DENTAL HOSPITAL OF LONDON, for the
Lords of the Admiralty, during the Year 1888.

No. of Patients, 262.

No. of Fillings 218,—Amalgam, 170, Cement, 42, Gutta-Percha,
5, Gold, 1.

Details of some Operations. Scaling, 2, Gum treatment, 1,
Dressings, only 3. Rhizodontophy, 1.*

No. of cases of advice, extraction, etc., including some fillings
not recorded, 122.

Age in Years.	14	15	16	17	18	19	20	21	22	23	24
No. of Recruits.	5	51	29	24	83	33	15	12	6	3	1
Fillings.	6	58	32	39	10	45	23	27	7	6	3

* This case is curious and suggestive, no other operation being recorded for this patient.

Is not this a practical proof of the kind of service which dental science can render to the State? I strongly maintain, however, that it is no measure of the real amount or value of the services which might be rendered by a proper and efficient organisation for carrying out conservative dental treatment. This is obvious from two facts :—

- (1.) The execution of the work is carried out by dental students, who are in the process of learning their profession; and, therefore, is only indicative of what might be obtained by the employment of fully qualified dental practitioners of some experience.
- (2.) This arrangement is confined to only one recruiting station.

It might be supposed that this arrangement which is excellent, as far as it goes, was initiated at the suggestion of the Medical Department. As all the other officers concerned have now been changed, there can be no objection to my stating that the present arrangement is entirely due to the enlightened and far-seeing action of Sir Anthony Hoskins, then one of the Lords of the Admiralty, aided by the sympathetic support of Colonel Welch, the then Superintendent of the Recruiting Station. While expressing profound satisfaction at so practical a recognition of the benefits derivable by the State from the services of the dental practitioner, we must enter a protest at the nature of the recognition. Is it fair on the part of the State to so avail itself of the advantages of a purely charitable institution, mainly established and upheld by the donations of the dental profession, instead of employing the services of fully qualified dental practitioners who, in accordance with the regulations of the State, have become so qualified by undergoing a long course of special training at a considerable cost?

If the services of fully qualified dental practitioners were employed, we should recommend the Government to extend the scope of the experiment to the recruiting stations throughout the country as the necessary corollary of the success of the present arrangement.

The contract with the Dental Hospital of London was all very well as an experiment, but it has now been sufficiently tested. In fact, its continuation is a manifest injustice to an honourable profession. I believe the members of the Navy and Army Medical Departments would be the first to appreciate the unfairness of it, and, now that it has been

pointed out to them, I trust they will do all in their power to have it rectified.

In April 1888, the Representative Board of the British Dental Association through its Sub-Committee presented a memorial to the Lords Commissioners of the Admiralty requesting permission to examine the recruits passing through the London recruiting depôt, to collect statistics as to the condition of the teeth, and to report to their Lordships thereon, with a view to increasing the number of recruits available for the service, and thus promoting the efficiency of the Royal Navy and the Royal Marines. The reply to this memorial was to the effect that, "Their Lordships are advised that no benefit would accrue to the recruiting of men and boys for the navy by the adoption of this proposal, and that the arrangements at present in force provide for all the requirements in the matter." In consequence of this reply, the Sub-Committee took no further action in the matter.

That pressure should be put upon their Lordships to reconsider their attitude, is supported by the following statements :—

- (1.) The present arrangement with the Dental Hospital of London has resulted in the addition of a certain number of men and boys to the Service, who otherwise would have been ineligible candidates on account of "defective teeth."
- (2.) In the opinion of dental experts, this number is capable of being greatly increased.
- (3.) The arrangement at present in force is a practical recognition of the necessity for the services of the dental practitioner, but the recognition is unsatisfactory because the State is here availing itself of the advantages of a purely charitable institution, and the operations are necessarily performed by dental students, and not by qualified practitioners.
- (4.) The present arrangement having been annually renewed since 1885, is an irrefutable proof of the kind of service dental science can render to the State, but should not be considered a full measure of the benefits derivable therefrom.
- (5.) From the fact that dental surgery enters into no part of the special training of the naval medical officer at Haslar, and that it is not generally in-

cluded in his medical training previous to his entering into the service, the only really competent advice Lordships can have on this subject must be from special experts, such as has been proposed should be appointed for the examination of the recruits.

One would naturally suppose that, since the State makes it an important matter that the recruits, on entering the service, should have good teeth, it would supply the necessary equipment, and make some provision for insuring that, at least, some of its medical officers should be capable of watching over, and taking care of the teeth afterwards. We shall presently see that it does not do so. Many navy medical officers support the opinion that it should, but feel powerless to effect a reform.

One of the principal surgeons in the United States navy wrote to me, that in his opinion, "it would only be a matter of time, though, when dentists will be admitted into the navy, as their services are certainly much required by men and officers. I had a practical dentist with me as apothecary on the last ship I served on. He did a great deal of dental work, for which he was paid by those on whom he operated. Naval medical officers do not know anything about the practical work of dentistry as far as my experience goes. As it is, we exclude those whose teeth are bad from the navy, thus doing away with the necessity of doing work of this kind."

Though this last statement may seem contradictory to his previous assertion, that the services of dentists are certainly required by men and officers, it serves to explain the impression which apparently exists, both in the medical department and amongst the higher officials, that in consequence of the stringency of the regulations on entering the navy, there is little necessity for making any provision for the teeth of the sailor, marine, or artificer.

A short study of the clinical aspect of dental caries conclusively proves that it is essentially a disease of youth, and that the greatest ravages occur between the 16th and the 25th year. Magitot in a paper on "The Curability of Dental Caries," showed that putting aside the extractions for irregularities, anomalies, accidents of the wisdom teeth, &c., in a total of 2,000 teeth, the cures amounted to 1,980, while the extractions numbered 20, or 99 per cent. cures, and 1 per cent. extractions, and further that the period of greatest

frequency of the cases undertaken was that of from 20 to 30 years. In the case of such teeth as recruits must have, I should say the curability of dental caries was nearer 99.9 per cent.

It is impossible, therefore, to suppose that, out of the total force of over 60,000 officers and men, diseases of the mouth and teeth are unknown. In a short conversation with a long service man now engaged in recruiting, he informed me that acute suffering from the teeth was not at all an uncommon occurrence on board ship, that as far as he knew extraction was the only treatment, and that he had never known of a sailor having had a tooth stopped, except by a civilian practitioner at his own expense. He himself had lost nine teeth in his period of service. Two had been extracted by the naval surgeon, and the other seven had been extracted by the sick berth steward. Judging from the excellent quality of his remaining teeth, it is not improbable that with timely remedial treatment he might then have had a full dental armament. I think it will be found that, in so far as extraction is concerned, as well as in other matters, the sick berth steward is the analogue of the hospital sergeant in the army.

By far the most important evidence on this subject, however is a report made by a navy medical officer on the subject of "Blue Jackets' Teeth," in which he embodies a series of reliable statistics compiled while serving at the Royal Naval Barracks, Sheerness, in 1880, with a view to their being submitted to the higher authorities as showing the necessity for the employment of dentists at the large home hospitals. A step, which in his opinion, "will soon be ripe for consideration, and cannot in this enlightened age be much longer postponed." I have been privileged to examine these interesting statistics, and to peruse his draft report, presented some years ago, and of which I shall endeavour to give you the salient features.

After referring with justifiable pride to the enormously improved health of the navy, he remarks, "Are we sure that we have done all that lies in our power, compatible with the nature of the naval service to prevent disease. Are there no means by which we can raise the standard of the health of our seamen, high as it is, besides those already employed? These reflections have led me to the conclusion that the teeth of the men are more worthy of attention. It is unquestionable that formerly medical officers themselves had a great tendency to

neglect the teeth of the men under their charge, and to relegate the duties of extraction to their sick berth steward. When serving in 1870 on board H.M.S. 'Warrior,' I was one day horrified by the sick berth steward producing two of Lazenby's pickle bottles, one of which was full, and the other two-thirds full of teeth, which the man said he had extracted in 10 months without the knowledge of the medical officer of the ship. He was not a little proud of the achievement, and although the time he took may have been longer than he said, that sight made a great impression upon me. It struck me that it represented a great amount of pain and suffering of which the medical officials themselves had no conception, and I suppose that this ship was in no sense exceptional."

"Insufficient mastication of food, and consequent chronic dyspepsia with all its attendant maladies are certain and undeniable results of decayed and imperfect teeth. In the naval service a large proportion of disease is directly or indirectly traceable to bad teeth, although rarely recognised as such. Neuralgia, earache, ulcer of the tongue, and even epithelioma, odontomes, periostitis, necrosis of the maxilla, abscess, salivary fistula, empyema of the antrum, constipation and diarrhoea, dyspepsia and debility are, with exceptions, simple cases of cause and effect."

After referring to the more remote effects and rarer disease forms which may be attributed to reflex irritation of peripheral nerves set up by a diseased condition of the teeth, he continues, "It is unquestionable that a large proportion of the disease enumerated is the effect of bad teeth, as we see them in the service, and it must be in the experience of every observant medical officer, that men with bad teeth are more frequently under his care than those with sound teeth."

"From these considerations, and the opportunities afforded me while serving at the Royal Navy Barracks at Sheerness, I was led to institute an inquiry by actual personal examination of the teeth of upwards of 1,000 men, limiting the investigation to blue-jackets of over 20 years of age, who had entered the service as boys, and who therefore, it was to be presumed, were of good physique and constitution, and whose teeth were in good condition at the time of joining the service."

The result of this enquiry will be found in the following tabular statement which I have compiled with the greatest care, and for the accuracy of which I can vouch. When it is remembered that it presents the careful

examination of some 30,000 teeth, it will be admitted that the task I set myself was not a light one, and I trust that I may not be considered presumptuous if I express the hope that this record may prove of some value in the future, and may ultimately lead to the adoption of measures, which will effect a reduction of suffering on the one hand, and an increased efficiency of men on the other.

"Of the total of 1,022 men whose teeth I examined, representing 32,704 teeth in the aggregate—or, deducting 1,030 teeth not erupted, 31,674 teeth—no less than 4,929 were extracted or decayed, being rather more than one-seventh of the total number of teeth, and this, considering the age and quality of the men, is strikingly large."

The analysis of this table proves that the loss is principally amongst those teeth on which the "grinding capacity" depends. The ratio being 1.55 in the incisor region, 4.35 in the bicuspid region, and 9.65 in the molar region per cent. of the total number of 31,674 teeth, and therefore not including the 1,030 third molars which were absent.*

He continues—

"What is the cause of this high rate of destruction among the teeth of our blue-jackets? These men are carefully selected for the service at a time when it may be safely assumed that the teeth are invariably sound and good, and yet, before completing his 21st year, the boy will certainly have on the average more than three bad teeth, and at 40 years of age nearly eight.

"There are in the Royal Navy three great causes always acting to produce this deterioration of the men's teeth:—

"(1). Want of cleanliness.

"(2). Want of employment for the teeth.

"(3). Insufficient professional attendance to the teeth.

"(1). As regards the want of cleanliness, we are familiar with the fact that decay of the teeth commences externally, or, in other words, first shows itself on the enamel, and in most cases is the result of chemical action produced by the decomposition of particles of food that collect or lodge in interstices or depressions of the teeth while eating. I need not enlarge on this, as it is undisputed that neglect to clean the teeth

* These ratios scarcely give an adequate notion of the real loss as out of every 100 molars one third were either carious or absent, the ratios being 42.5, 22.87, and 34.63 for the first, second, and third molars respectively, while a large number of the sound teeth remaining must have been functionless from loss of the antagonising teeth.

encourages the formation of acid, the accumulation of tartar, and so seriously injures the teeth. The remedy of that is, of course, the use of a tooth brush, or better, of a pointed stick of soft wood to be used by friction up and down after the manner of the natives of India.

“How many blue-jackets clean their teeth from one end of the year to the other?”

“(2). The idea of the want of employment for the teeth may raise a smile when the regulation ‘hard tack,’ so much in use in the service, is borne in mind. But it is this very ‘hard tack,’ in my opinion, which is the main cause of the deterioration of our men’s teeth, for in consequence of the hardness of ship biscuits, the men soak them in their tea and then bolt them without mastication, and, as this kind of food contributes two of the three daily meals when at sea, the teeth are but very inadequately used.

“(3). As to insufficient professional attention to the teeth, this cause cannot be denied, as at the present time there is absolutely no professional attention paid to the teeth. I would suggest that, at the large home hospitals of Haslar, Plymouth, and Chatham, skilled dentists be permanently attached, whose sole duty should be to attend to the teeth of the men. Is this an unreasonable proposition? Is the Royal Navy always to be in the rear of advancing art, and are we always to be the last to adopt such means as science has placed at our disposal for the alleviation of human suffering?”

After referring to the remarkable advance in modern dentistry, and the professional curriculum now required of the dental practitioner “who now takes his place beside ourselves,” he continues, “and is the Royal Navy in this respect to continue in the same condition as it was 40 years ago? I trust and believe not. Dentists at the home hospital are necessary, and the time is ripe. It is inevitable that sooner or later efficient dental treatment must be provided. It will be true economy in the end. How many men date their deterioration of health from bad teeth which might have been prevented by the early attention of a dentist? How many men have ultimately been invalided at a great cost to the country, and how many men have died because their teeth were allowed to decay and ruin? No man can tell, but my insinuations are none the less true, and the remedy—the only one—is the induction of skilled dentists into the home hospitals.

It may seem to you, as it does to me, that it would be

difficult to exaggerate the value and importance of such a report, coming, as it does, from a medical officer of long service and high rank, and, therefore, absolutely beyond the faintest suspicion of being put forward from any self-interested motives. The Department, however, apparently showed its appreciation by pigeon-holing it 'pour encourager les autres.'

With regard to the hygiene of the mouth, which is evidently from the foregoing report so much neglected in the navy, I should like to record another instance of the conventional attitude of Government officials to obvious reforms and common-sense proposals. The secretary, on behalf of the Medical Committee of the National Dental Hospital, offered to supply to the Admiralty gratuitously, for distribution amongst the men, a large number of copies of a few brief rules as to how the mouth and the teeth should be cared for so that caries might be prevented. The proposal was courteously but firmly declined.

Another and very important piece of evidence in support of our contention, may be derived from the Annual Statistical Report of the Health of the Navy, published by the Department itself. It would be a vain effort to distinguish many of the diseases which do arise from defective teeth by an examination of the various diseases as tabulated in these reports. By singling out one, viz., dyspepsia, of which defective teeth is a well-recognized cause, there is abundant proof that loss of the teeth is a recognized cause of invaliding. By examining the details given under the head of diseases of the digestive system in the report for the year 1888, we find that at the

- (1.) Home Station. (Mean force, 24,000.) "Loss of teeth" was the cause of invaliding in three cases, dyspepsia in one. Cases of dyspepsia, no return.
- (2.) Mediterranean Station. (Mean force, 5,800.) Out of the 13 invaliding one of these is returned as for "loss of teeth." Cases of dyspepsia, 120.
- (3.) North America and West Indies Station. (Mean force, 2,600.) No detailed returns. Cases of dyspepsia, 75.
- (4.) South-East Coast of Africa Station. (Mean force, 550.) No detailed returns.
- (5.) Pacific Station. (Mean force, 1,480.) Twenty-nine invalided, one was for "defective teeth and resulting dyspepsia." Cases of dyspepsia, 43.
- (6.) West Coast of Africa and Cape of Good Hope Station. (Mean force, 1,800.) No detailed returns.

- (7.) East Indies Station. (Mean force, 2,280.) No detailed returns.
- (8.) China Station. (Mean force, 3,950.) Seventy eight invalided, "four for dyspepsia, &c., dependent on defective teeth." Cases of dyspepsia, 91.
- (9.) Australian Station. (Mean force, 2,000.) Thirty-two invalided, one for dyspepsia, &c., due to defective teeth.
- (10.) Irregular force. (Mean force, 5,600.) Cases of dyspepsia, 109.

Here we have evidence of 439 cases of dyspepsia from returns of only a portion of the fleet, and from another part of the return we find that there were at least 813 cases. The most important point for our present purpose is that from the returns of only a section of the fleet we find that 12 men were invalided solely on account of defective or loss of teeth. This condition of affairs seems clearly to indicate that the suggestion with regard to the appointment of dental practitioners to the Home Station will not be sufficient, and that similar appointments should also be made at the headquarters of each of the foreign stations.

When afloat, a naval surgeon has to provide all his own instruments according to a list which includes a case of extracting instruments; on shore the Department provides instruments, but as there are no regularly published regulations containing the details of equipment as in the case of the army, one is unable to assert anything definite as to the dental equipment, except that the "tooth-stopping case" included in the Army Medical Regulations is not provided.

A knowledge of State dental equipments warrants one in expecting to find, in this as in other departments, that the forceps are sometimes better calculated to snap off the crown than to extract the tooth; that the excavators, instead of being solid complete instruments in themselves, consist of a variety of blades, fitting into a common handle, and that the prehistoric tooth key is an invariable item in the dental equipment. One would be safe also in asserting that examination instruments, the mouth mirror, the probe, and the dressing forceps, would be conspicuous by their absence.

One would naturally suppose that since the Department insists upon the naval surgeon possessing a dental equipment, that it would also make sure of his possessing some knowledge and training in the use of these instruments. The naval sur-

geon undergoes a period of special training at the Royal Naval Hospital, Haslar, but dental surgery and dental operations form no part of their course, although the Department must be perfectly well aware of the fact that dental training is not generally included in the medical training of the candidate before entering the service. One day it will be recognised that no medical training can be really complete while it totally ignores the elements and principles of dental pathology and surgery, but meanwhile the Medical Department should exact from the naval surgeon, before he takes service afloat and probably abroad, the power to relieve the commonest and one of the most painful diseases to which the sailor is exposed, and that without resort to the often unnecessary torture of extraction.

The question of attention to the teeth of the men who constitute that important body known as the Royal Naval Reserve might also well occupy our time, but I trust sufficient has been already advanced to prove that it is of national importance that similar provision for remedial treatment should be made for them. I shall therefore content myself by quoting a passage from a paper by Mr. Fisher, of Dundee, who has distinguished himself by his energetic and persistent advocacy not only for the necessity of dental appointments in the Royal Navy, but also for the compulsory attention to the teeth of school children, especially from its important bearing on admission into the army and navy.

“The Royal Naval Reserve consists of 30,000 men, made up of seamen drawn from the Mercantile Marine Service, 20,000 of whom are known as first class men, and 10,000 as second class men. I need not enumerate the qualifying distinctions, but no sailor can now enter this service, or even rejoin—which he does every fifth year—who has lost from five to seven teeth, and this means, in money, to the first class men, £10 5s., and to the second class men £8 per annum, with medical and other advantages while on duty. I entered into this pretty fully in my last paper, therefore I need not recapitulate, but draw attention to the new class of men the Royal Naval Reserve are now enrolling, namely, firemen or stokers for their large steamships, this class receiving £6 per annum as a retaining fee, with no drill. Since the establishment of the firemen class in December, 1885, out of 320 applications for enrolment, 36 have been rejected on account of defective teeth, from the reports which are deposited in the

London central office. In all probability there would be more than that, as the local secretaries of the Mercantile Marine Boards very often answer the men thus—‘Oh! you are defective in the teeth, and you need not go to the doctor, as you would not be passed,’ and hence there are numbers of men who are never entered in the books.”

The treatment of this subject would not be complete without some allusion to its economic features. I shall do so, however, very briefly but very effectively by a quotation from the address of the President of the British Dental Association, at its last annual meeting, in which the position of dentistry with regard to public services formed the principal subject. I should also state that it is to him, Mr. Browne-Mason, of Exeter, that I am indebted for access to the report of the naval medical officer, from which I have so largely quoted.

“That this addition of qualified dental surgeons to the staff of the army and navy medical departments would entail a very slight outlay on the part of the nation in comparison with the gain that would accrue, I have no sort of doubt, and the nation would be repaid over and over again by the increased length of time we should find the men serviceable. The statistics of work and cost of the same furnished by the reports of our dental hospitals show at what a comparatively little cost, over and above the pay of such officers, such a service could be maintained, for, commensurate with the benefits conferred, no medical charities cost so little, there being no expenses for maintenance of patients, and I assert that it would be a national disgrace if such an outlay were grudged by Parliament, even if the reasons for calling it into existence were humanitarian only, instead of being, as they are, eminently utilitarian and economic.”

In the House of Commons the other day, we learned, from a discussion on the Education Bill, that having swallowed a camel, it was scarcely worth while straining at the gnat, and that, further, it was not worth while spoiling a ship for a halfpenny worth of tar. The Admiralty might regard the simile of the camel as disrespectful to it, however appropriate it might deem that of the gnat as descriptive of the attitude of the British Dental Association, therefore we will take the metaphor of the ship as more appropriate, and say that the cost of the reform we propose will be a halfpenny worth of ar. The Education Bill taught us that for the British

nation the commercial value of a halfpenny worth of tar is from ten to twenty thousand pounds. I firmly believe that the halfpenny worth of tar, or even less, expended on a corps of dental practitioners attached to the Army Medical Department would result in a tangible reduction of the expenditure of the Admiralty in other directions.

In conclusion, I trust that you will admit that a strong case has been made out for adoption of some method of dental reform in the Navy Medical Department. It is evident that such reform is not likely to arise spontaneously within the Department itself. The advantages of reform are so obvious that I trust that you will individually and collectively do what you can to promote such reforms in the interests of the State, and from a feeling of humane consideration for those who are defending our country both in peace and in war at the risk of loss of health, if not life itself.

ARSENICAL POISONING, ETC.

By W. R. TUCK, L.D.S., Truro.

ON taking a retrospect of some remarkable cases of a Torological character, which have fallen under my observation during a long period, many being unique, I think a narration of them would not be uninteresting to your readers.

My attention was called at an early date to the noxious influence of crude arsenical compounds. Mining, in the county of Cornwall is the chief industry, and I might say that when the mineral is first broken under ground it contains arsenic and sulphur; these two elements have to be thrown off in the process called "dressing."

Calcination and a series of other chemical agencies being employed in the reduction of the mineral into its metallic state. The burning house, with its tall chimney attached, is the place where the first manipulation begins, and the heat has to be raised to a considerable temperature, which is done by means of the great draught created. The foul gases are eliminated and pass off mainly through the flue mentioned, depositing much of the concrete matter in its circuit; this is eventually removed and converted into marketable commodities.

The vapours of these sulphurous arsenites pass off, always more or less impregnated with highly corrosive matter.

At the time from which my story dates, it was the custom to employ female labour for doing surface work in the mines. The reader will now in imagination go with me and look at these women standing on the northern side of one of the said flues or chimneys, with the wind blowing due south, which, with a low heavy atmosphere, would take the sulphuritic gases referred to, direct in the very mouths of these poor toilers, and it is distressing to think of them while pursuing their daily vocation for the bare means of subsistence, being of necessity compelled to inhale this pestiferous atmosphere, which sooner or later hurries many to a premature grave.

I have seen many cases of Thoracic and Visceral derangement from this cause which frequently baffled the skill of medical men in their diagnosis, so varied and complex are the symptoms in certain idiosyncrasies. Although a few common place enquiries, as to how and where they have been employed, would have enlightened the doctor in attendance, as to the nature of the disease, and suggested to him the proper course of treatment. This, if adopted in time, might have saved many from an untimely end, and their relatives from much anguish.

Another feature of this form of poisoning is that, where the highly corrosive and deadly vapours attack the nasal process and destroy it almost entirely, though strange to say, it does not at the same time affect the general constitution.

Since the time referred to, these matters are better regulated and often sheds are provided, which preclude the possibility of such disasters. It is now about twenty-five years since a commission was appointed by one government, to examine into the health, condition and longevity of the working miners of Cornwall. The Right Hon. Lord Kinnaird, the chairman, with some eminent doctors, came down to conduct the enquiry; on that occasion I was honoured by a letter of introduction to these gentlemen, as they had heard of the interest I felt in the working classes, especially those employed as described above. I was desirous to find an example of nasal mutilation from the vaporious poison mentioned, and on seeking information at the different times, in order to ascertain if any of their employeés were afflicted in that way. A subject was unfortunately soon found for these gentlemen (Drs. Peacock and Bankart), to see. I believe the young woman was subsequently sent to Londo

to undergo a plastic operation, in the hope of ameliorating the sad deformity. Another form of disease, also arising from the noxious effluvia, is, that its action on the teeth, produces a most unsightly erosion of the enamel surface, similar to what I have frequently seen in people returned from India who had taken (as I was informed) large quantities of oxide of arsenic. My experience of this metallic irritant, up to this time, led me to abandon the use of it entirely in my professional work.

As observed in a former paragraph, we applied to the mining executive for assistance in procuring the information required, and were met by one gentleman of influence, who proceeded to give us the history of a case which had recently fallen under his notice, and assured us on the most positive asseveration of its genuineness, *e.g.*, a youth about 16 or 18 years of age, was in the habit of visiting his mine, being an imbecile, no one interfered with him, and he was in consequence allowed great freedom. One of his favourite resorts was, the dressing house where the arsenic is prepared for the market, the girls employed, when at dinner, would often throw portions of their food to this poor idiot which sometimes falling short of the mark, would drop on the piles of powdered arsenic. This, however, did not deter him from finding the morsel and eating it, the girls meanwhile applauding such a feat. The remarkable part of the story consists in the fact, that no injurious effects followed upon eating the food so impregnated with poison.

This circumstance was brought before the notice of the Medical Staff connected with the commission, and I have a distinct recollection of Dr. Bankart remarking that if this could be attested by a scientific authority, it would completely upset the whole principal of Toxicology as applied to Medical jurisprudence, etc. I am not sufficiently versed in physiology or psychology, to say whether this dormant brain is in any way allied to the mucous membrane of the stomach, and so prevents poisonous effects. Perhaps some readers of your Journal may be able to throw light on this subject.

British Journal of Dental Science.

LONDON, SEPTEMBER 1st, 1891.

MR. CAMPION'S PAPER.

We must confess we felt a little bit disappointed by the latest addition, which that able writer Mr. George Campion has made, to the subject of dental education in his paper on "A proposed change in the English Dental Examination." Some papers are constructive and some destructive, this is of the latter kind. Both kinds are equally valuable, no doubt, but the latter would hardly call for comment at our hands, and we should, perhaps, not have referred to this paper, if extracts from our pages were not amongst the quotations.

This paper starts with this hypothesis:—That it is not desirable to have a more lengthy curriculum than four years. This is surely not an unargumentative matter, yet it is dismissed with a short reference to the proposed five years curriculum for a medical qualification, and the statement that the cases are not parallel. Perhaps not, but what the difference in length of time since the enforcement of registration in the two professions, or the overcrowding of one as against the other, has to do with the question we are at a loss to see. The former seems self evident; and if examinations are simply, or in any sense, framed to form monopolies, then it is a prostitution of their true purposes and aims. We are told that this four years curriculum "is *de jure* though not, perhaps, always *de facto*, the basis of all our reasoning in shaping our professional education." We utterly

deny this, and moreover, we make this statement :—that but a few men fulfil their curriculum in four years. Indeed the curriculum states that three years mechanical and two of hospital training are required, though it gives as the minimum time, in which this may be completed, as four years. Now this can only be effected by the last year of the mechanical and the first of the hospital training running conjointly. This could only be the case where the pupil was articled in the same town as the hospital was situated, and we all know that in these cases the third year's mechanical training is a farce; in many cases the pupil never enters the workroom, and his obliging master or preceptor signs him up. If Mr. Champion agrees with this practice we have nothing further to say, except that to call such a statement an hypothesis is absurd. Really, most of the arguments, which follow, start from this hypothesis, and then wander in a circle back to it again. But if the hypothesis be false, what can we say to the argument? In dealing with this subject we would prefer to look upon the present curriculum, as one occupying five years; it was in this sense that we spoke of the extra year, (page 1086 Dec. 1st., 1890) to which Mr. Champion makes reference, meaning an extra year at the hospital, which could be spared from the pupilage. We are quite at one with those who insist that three years is all too little to learn mechanical work, and we would let the students spend this extra year in the workroom of the hospital, in fitting in dentures and in the elementary anatomical and physiological studies at the general hospital. If the mechanical department at the hospital is to be of any real service, some such arrangement must be made. At present, not only does it occupy far too much of the time of the teaching staff, but it trespasses far too largely on those two years, which are all too short for the more purely hospital studies.

Although it would be easy to show the desirability of a dentist being also a medical man, a desirability which even Mr. Champion admits, though he denies its expediency, we would now confine ourselves to speaking of the 1st and 2nd conjoint examinations.

Let us take the four subjects, Chemistry, Materia Medica, Anatomy and Physiology. Surely no word is needed to show the desirability of a knowledge of each of these. It is no very profound knowledge which is needed, but one which would serve as a basis for future study. No new subjects are introduced, the student already attends lectures on these subjects, and he is merely requested not to waste this time, but to pay attention, to do a little reading, and in due course to show that he has done so by passing a fair test examination. Now what are the advantages of this? We have no hesitation in saying, that a man who has a fair knowledge of these four subjects is already more than half way to a knowledge of medicine and surgery. Now if a student has passed the Anatomy and Physiology examination at the end of the first eighteen months of his hospital work, and has already passed in Chemistry and Materia Medica during his pupilage (as he ought to) he would be free to devote the last eighteen months of the three years purely to the operating dental surgery and ward work. It is simply absurd to say that this is an attempt to dwarf and stunt the development of the practical and manual side of our education," and if this would "go far to crush out that tendency to variation, which, in the sphere of specialised and technical education, as in biology, is the very basis of development," then we can only say that this "tendency to variation" must be of such a feeble order that it would go under in the struggle for existence under this, or any other circumstances.

The only really new point which Mr. Campion raises, is an idea to have the examination in mechanical work at the end of the pupilage. This would be so far desirable that it would ensure the pupil working during these three years, a period which is often more wasted than spent as it should be.

To some of us there is something very amusing in the idea of lessons in comparative dental anatomy, washed

down, as it were, by doses of music. We are not wholly prepared to condemn the thing. It matters very little how a man learns so long as he does learn. If some prefer to take instruction in this light and elegant fashion let them, only we cannot help wondering at it. A copy of the *Daily Telegraph*, of Launceston, Tasmania, which is just to hand, narrates how Mr. Wells, of that city, gave a lecture on Dental Anatomy, and a very good lecture it appears to have been, and then we read that it was interspersed with some excellent music by Mr. W. L. Wells, who sang among other members, "I'm off to the wars again." Very nice, no doubt, but rather peculiar.

THE authorities at the Leicester Square Dental Hospital, have at length white-washed and thoroughly cleansed the building. In order to make this possible the hospital was closed for a couple of weeks, but the result has certainly justified this step, indeed we could wish it were an annual one. The gain which a little white-wash has made in the light available for seeing properly, is simply enormous, and would hardly be realized except by those who have practical experience under both the old and the new condition of affairs.

THE twenty-second ultimo was the last day on which men in practice before 1878, were allowed to register, on the strength of so being in practice. We hear that there was quite a rush of men at the close. Thirteen years is a long period of grace, yet many seem to have left registering till the last moment, and others again, have not even succeeded in getting to time. They did not apply till after the doors were shut. They were too late.

Abstracts of British & Foreign Journals.

THE FRENCH DENTAL JOURNALS.

The *L'Odontologie* for June publishes a paper by M. Paul Dubois on *Gingivitis*. He distinguishes *Gingivitis* from *Stomatitis* by the former having its seat entirely, or almost entirely in the gums, while the latter invades the whole buccal cavity. The causes of *gingivitis* are multiple, but the disease is generally due to local mechanical irritation, tartar, abuse of tobacco, difficult eruption of teeth, or continuous wearing of artificial teeth. General causes, however, are not unimportant, as the gums participate even more than the teeth in the health fluctuations of the individual. Such causes may be the elimination of certain drugs, alterations of the saliva, blood, or blood vessels, certain diatheses, mal-nutrition, fever, the puerperal state, menstruation and affections of the digestive tract. The lower jaw is more subject to the diseases than the upper. The signs are, recession of gums, serous, or in severe cases purulent secretion, desquamation of epithelium, in severe cases erosion and ulceration, looseness of teeth due to extension of inflammation to the alveolo-dental membrane. The drugs which affect the gums are put down as mercury, bismuth, silver, arsenic, lead and copper. "As for phosphorus," says M. Dubois, "the absorption of phosphorated drugs gives rise according to some to a fungous or ulcerative *gingivitis*, but as far as poisoning of a commercial origin, (*e.g.* in match factories,) is concerned I deny its existence." M. Dubois divides the disease under the following heads. (I). Simple, or erythematous, due to tartar, gritty insoluble tooth-powders, abuse of tobacco, and in the puerperal state. (II). Ulcerative, found in people in bad hygienic surroundings, as soldiers in the fields, sailors, prisoners, and also as an extension from the simple form. (III). Phlegmonous, caused by inhibition of mercury, difficult eruption of wisdom teeth, &c., and having for objective signs marked swelling, bleeding on the least touch, a sero-purulent secretion, thickening of the saliva, tenderness and looseness of the teeth, and generally some febrile disturbance. It always leads to absorption of the alveolus, and sometimes to loss of the teeth. (IV) Fungous, due to persistent irritation such as is found in

patients who wear plates day and night, especially when not carefully cleansed, or badly fitted. The gums are of a rich red colour, spongy and thickened, capillaries are dilated and bleed freely. (v). Ulcero-membranous. This form seems to have occurred in epidemics, the chief cases recorded being those by Bergeron in 1885, and by Feuvrier in 1873. The latter records that of 320 men in barracks at the time, 140 were attacked. It is thus described :—The ulceration at first slight and superficial, soon extends in breadth and depth, sometimes, as it appears on the gums, covered with a greyish membrane, sometimes, as one sees it on the inside of the cheek and tonsils, its thickened border surrounds a layer of hard yellow tissue, spotted with ecchymoses, always adherent in the centre, and bathed in a sanious liquid, half blood, half pus. M. Dubois opines that it is a disease of microbic origin.

The treatment of the different forms of the disease consists in removing the cause, and local applications such as chlorate of potash, chlorate of soda or borax. Alum should not be used on account of its harmful action on the enamel (according to Magitot); for the same reason acids are to be avoided. In very chronic cases, the actual cautery may be employed, scarification or very occasionally application of chloride of zinc or nitrate of silver. Cocaine, or extract of opium may be used in very painful cases.

L'Odontologie publishes in full the report of the Committee of Regulation of the Association Generale de Dentistes de France, (the French Dental Association) on the law concerning the practice of medicine, &c., drawn up by M. Touchard. It is a most interesting report giving the history of the dental profession, and the progress that has been made in recent years, and concludes with the alterations in the law suggested by the Committee, and the arguments in support of them. M. Touchard draws the following picture of the state of affairs at the beginning of the century:—"In 1791 all professions were made free, but numerous abuses having been produced, in 1803 the Government regulated the practice of medicine without troubling about dentists. This omission left to dentists the right of practising their art in entire independence, but this very liberty which they enjoyed did not conduce to the advancement of their profession. The recruiting of its ranks went on everywhere, anyone who knew

how to handle a tool, or was tired of some unprofitable business, turned his hand to dentistry. Locksmiths, blacksmiths, men of all sorts became dentists; not only were they quite wanting in professional instruction, but even general education was to them quite superfluous. True, these men only held a very low position in the profession, but they were a part of it, and were sufficient to throw discredit on the whole. Above them came the mechanical dentists, men quite capable of making artificial plates, but entirely lacking in scientific knowledge, having only learnt their calling in the workroom of other dentists, older, but often as untaught as themselves. Finally, at the head of the profession were a few doctors, who for various reasons had given up medicine for dentistry, but who could not by reason of their lack of technical knowledge be thoroughly competent dentists." The treatment at this time was as unpolished as the men themselves, and consisted almost entirely in extractions, with a few simple filling operations with cements or amalgams. While this state of things was continuing, in other countries dental schools were being founded, turning out thoroughly qualified practitioners, and this was the commencement of the invasion of France by these foreign dentists. "Our gates being wide open, they flocked in, and the public put themselves confidently in the hands of foreigners who could parade titles more or less grandiose, and diplomas more or less fantastic." This state of things continued till 1879, when a group of Parisian dentists, mindful of the interests of the future, and of the raising of their profession, united to give the profession what it lacked, viz., scientific, rational and practical instruction. By their efforts was started the first French dental school (L'Ecole dentaire de Paris), which was opened in November, 1880, its object being (1) to give professional instruction to dental students, and to grant them, if found qualified at the end of their studies, the diploma of the school (D.E.D.P.), and (2) to give gratuitous advice and treatment to the necessitous poor. In the ten years it has been established 600 students have passed through the school, 167 having obtained the diploma (D.E.D.P.). Moreover, affiliated to the school, has been established a scientific society, the Société Odontologique de Paris, with a special library and museum, and a monthly periodical *L'Odontologie*. Having thus by their own efforts and at their own initiative already accomplished so much, M. Touchard contends that the

profession has shown itself quite capable of self-guidance and self-control, and might be left to work out its own salvation without official interference. He concludes his report by giving the text of the law as it stands at present, and the alteration that the Committee are desirous of having introduced when it comes before the Senate. These we have already given in full in a previous issue.

THE DISINFECTION OF DENTAL AND SURGICAL INSTRUMENTS.

By W. D. MILLER, M.D., D.D.S., Berlin.

(Continued from page 767.)

RESULTS.

Some general results of interest were obtained, which may be first given :

1. The length of time necessary to sterilize a body by a chemical agent depends greatly upon the character of the body as well as upon the character of the matter with which it is coated. Porous bodies, as may be readily understood, are more difficult to sterilize than non-porous ones. Peas, for example, require more time for sterilization than the glass cylinders.

Again, small bodies are more readily rendered sterile than larger ones ; for example, shot more readily than large bullets, and, by inference, excavators probably more readily than forceps.* Also the drier and more insoluble the material with which the body is coated, and the more liable it is to form inert compounds with the antiseptic, the more difficult it will be to sterilize. It is consequently above all things desirable to employ the antiseptic in a form in which the infectious matter is soluble, and this, in the vast majority of cases, will be in an aqueous solution.

* I do not mean to say that this principle will invariably hold good. This question would have to be settled by experiment. In the case referred to, it may be that the bullets resisted the action of the antiseptic longer than the shot because they have a larger surface of contact with the bottom of the vessel.

Carbolic Acid.

The two per cent. to five per cent. aqueous solutions of this antiseptic have long been the most popular means of disinfecting instruments of whatever nature, and the impression exists among a great many that it is but necessary to dip the instrument in the solution for a fraction of a minute in order to render it completely sterile. This, however, is far from being the case, as will easily be seen from the record of experiments given below :

Body experimented upon.			Time of exposure.	Number of tests.	Sterile.	Not sterile.
Glass cylinders	...	...	3 minutes.	6	0	6
"	"	...	5 "	6	0	6
"	"	...	7 "	2	0	2
"	"	...	8 "	21	3	18
"	"	...	9 "	8	3	5
"	"	...	10 "	3	2	1
"	"	...	12 "	7	4	3
"	"	...	15 "	8	5	3
"	"	...	20 "	9	7	2
Peas	...	...	10 "	6	0	6
"	...	...	14 "	4	0	4
"	...	...	18 "	3	0	3
Bullets	...	...	16 "	8	2	6
Shot	...	...	16 "	8	3	5

It will be seen from these results that even twenty minutes will not always suffice to sterilize small bodies by a five per cent. solution of carbolic acid. We cannot, even with moderate certainty, count upon a thorough sterilization in less than an hour. A large bur from the instrumentarium of a dental student, after being exposed for two hours to the action of the five per cent. solution, was found still to contain living germs.

The results obtained by Miguel* and Redard† are still more unfavourable to the carbolic acid solutions. These authors found that bodies infected with pus still carried living germs after being exposed to the action of a five per cent. solution,

* Annuaire de Mont-Souris, 1880.

† Revue de Chirurgie, 1888.

‡ Zeitschrift für Hygiene, 1889. Bd. 6.

and at the end of that time found that the spores still retained their power of development.

The experiments with concentrated carbolic acid gave results which are still more surprising. I have for some months been in the habit of dipping every instrument which I use in the mouth into concentrated carbolic acid immediately before using it, and laboured under the impression that all micro-organisms would be devitalized instantaneously. I was consequently not a little surprised to find that of twenty-one pieces that had been exposed for varying periods of time ranging from one to twelve minutes, only two were sterilized.

This result is, however, not so very surprising when we take into consideration that the antiseptic, however powerful, cannot act upon the micro-organisms until it has dissolved or permeated the material in which they are imbedded.

Trichlorophenol

was also made use of in five per cent. aqueous solutions, with the results seen in the following table :

Body experimented upon.	Time of exposure.	Number of tests.	Sterile.	Not sterile.
Glass cylinders ...	7 minutes.	3	1	2
" " ...	8 "	19	5	14
" " ...	9 "	6	4	2
" " ...	12 "	6	4	2
" " ...	20 "	4	2	2
Peas ...	6 "	2	0	2
" ...	10 "	2	0	2
" ...	14 "	4	1	3
" ...	18 "	5	1	4
Bullets ...	16 "	7	1	6
Shot ...	16 "	7	5	2

A comparison of these two tables indicates a slight advantage in favour of trichlorophenol ; but shows, however, at the same time that the five per cent. solution is not adapted for the purpose of sterilizing dental instruments, since we cannot afford to spend an hour's time after every operation in sterilizing.

Lysol gave results nearly identical with those of trichlor-

phenol, and consequently need not receive especial consideration.

Bichloride of Mercury

in a five per cent. aqueous solution was found to be by far the most prompt in its action of all the substances tested, as will be seen by the accompanying table of results :

Body experimented upon.	Time of exposure.	Number of tests.	Sterile.	Not sterile.
Glass Cylinders ...	5 minutes.	6	5	1
" " ...	8 "	17	15	2
" " ...	9 "	8	7	1
" " ...	12 "	4	4	0
Peas ...	2 "	1	0	1
" " ...	4 "	1	1	0
" " ...	2, 4, and 6 minutes,	3	0	3

Unless for particular exceptional cases, an action of fifteen to twenty minutes could be relied upon to produce a thorough sterilization of instruments ; but the time required is, as seen, still so long as to render the bichloride of mercury in five per cent. aqueous solutions unsuitable for the purpose. More than this, the powerful action of bichloride upon the steel or iron very seriously interferes with its constant use for sterilizing instruments made of these materials.

It will not be at all necessary to refer to the results obtained by the various other substances tested. Suffice it to say that they all fell far short of those already mentioned. The ten per cent. solution of the *peroxide of hydrogen* came next to carbolic acid, but is considerably inferior to it. *The essential oils* in emulsions, as well as in pure form, utterly failed to produce the desired action.

Mixed Antiseptics.

The idea that by application of a mixture of two or more antiseptics a more rapid or powerful action may be obtained has found its expression in the various mixtures which have been recommended as mouth-washes. In the present case the thought occurred to me that by a combination of peroxide of hydrogen with some active antiseptic the former

would dissolve or tend to break up the small particles of matter in which bacteria are usually enclosed, and thus render them more easily accessible to the other component of the mixture.

I accordingly applied tests to a five per cent. solution of trichlorphenol in peroxide of hydrogen, and invariably found that this solution acted slightly more rapidly than the simple five per cent. aqueous solution of trichlorphenol alone. The improvement was, however, not so great as to encourage further experimentation in that direction.

Boiling Water.

After I had satisfied myself by a thousand tests that none of the chemical antiseptics at present at our disposal meet the requirements of a rapid, convenient, and absolutely sure mode of sterilization for dental instruments, I turned my attention to boiling water, and very soon became convinced that this is so far superior to all other means for sterilizing, so easy of application, and so rapid in its action, that it must recommend itself to every practicing dentist and physician at once.

I have found boiling water to accomplish in two minutes as much as the chemical agents ordinarily used in half an hour, as will be seen by the following table of results :

Body experimented upon.	Time of exposure	Number of tests.	Sterile.	Not sterile.
Glass cylinders ...	$\frac{1}{2}$ minute.	5	4	1
" " ...	1 "	10	9	1
" " ...	$1\frac{1}{2}$ minutes.	4	4	0
" " ...	2 to 3,,	15	14	1
" " ...	5 "	5	5	0

Experiments on other objects (peas, bullets, shot, etc.) gave corresponding results, so that I regard an exposure of three minutes to boiling water sufficient for sterilizing smaller dental instruments, *i.e.*, excavators, etc., unless they are particularly dirty : whereas for forceps it would be better to continue the action for five minutes.

Boiling Antiseptic Solutions,

such as five per cent. carbolic acid solution, act still more rapidly than simple boiling water. The disadvantages of such solutions will, however, be found to more than overbalance their greater rapidity of action.

Boiling Solution of Carbonate of Sodium.

I have found in agreement with the results obtained by Schimmelbusch* and Behriug,† that a one to two per cent. boiling solution of soda has a slightly stronger action than water alone. Its chief advantage, as pointed out by the first named author, lies in the fact that the rusting which is liable to occur when the instruments are boiled in water is avoided by the addition of soda.

An exposure of three to five minutes to a boiling one to two per cent. solution of soda is consequently the means I wish to recommend for sterilizing dental as well as surgical instruments. It is to be emphasized that the solution must not be simply hot, but boiling, since the motion of the boiling water materially assists in rapidly raising the temperature of the instrument to 100° C., and at the same time loosens up any matter that may be clinging to the instrument.

To many the results of my experiments may appear incredible. To those, however, who have had access to the literature of the subject, and in particular have followed the more recent communications, they will cause no surprise.

The view to which we are forced by the results obtained by nearly all who have worked at this subject is well summed up by Schimmelbusch,‡ who says, "Anyone who is obliged to perform a number of operations in succession upon aseptic and infected object with an instrumentarium kept in carbolic acid will soon become convinced, by failure in respect to the healing of the wound, of the inadequate disinfecting power of carbolic acid. Its disinfecting value in such cases may be placed at about zero."

* Arbeiten aus der chirurgischen Klinik V. Berlin, 1890.

† "Desinfection, Desinfectionsmittel and Desinfectionsmethoden." *Zeitschrift für Hygiene*, 1890. Bd. 9.

‡ *I. oc. cit.*

In the foregoing communication no reference has been made to the mechanical means of cleansing instruments. Naturally a thorough brushing of the instrument and rinsing in pure water goes a great way toward freeing it from germs, but it can never completely disinfect it; and whatever method of disinfecting we may use, the instruments should be first cleansed mechanically, though where boiling water is used for disinfecting, the mechanical cleansing beforehand may be virtually dispensed with. Furthermore, I wish to testify to the fact that although weak solutions of carbolic acid are very often illusory in their action, they are still better than nothing, and undoubtedly much good has resulted from their use; but we have no right to subject our patients to even a slight risk of infection by a partially disinfected instrument, when a complete disinfection may be accomplished so readily.

The dentist or surgeon who communicates a disease, per-chance syphilis, to the patient by the use of an impure instrument, has a burden of sin upon him greater than which there are but few. Besides, exquisite cleanliness and absolute freedom from germs constitute half the battle in many operations in dentistry as well as in surgery.

STERILIZATION OF TEETH FOR TRANSPLANTATION AND IMPLANTATION.

The possibility of transmitting infectious diseases by the operation of transplanting or implanting teeth renders it imperatively necessary that the teeth used for such purposes be absolutely free from living germs. It is generally accepted that the operator takes every possible precaution when he allows the tooth to lie for one-half to one hour in a one per cent. solution of carbolic acid, or in a 1 to 1000 solution of bichloride of mercury. The following experiment will, I think, convince every one that this treatment cannot be relied upon to bring about the desired result.

Two roots whose canals were thoroughly cleansed and filled with cement were placed for a short time in a culture of a pathogenic mouth-bacterium to be described in a later article. They were then dried and subjected, the one to the action of one per cent. carbolic acid, the other to a one-tenth per cent. solution of bichlorid of mercury, sixty and sixty-five minutes respectively. Thereupon they were rinsed in sterilized water and placed in tubes containing bouillon. Not only was the

bouillon in both tubes densely clouded in twenty-four hours, but a drop of it injected into the skin of a mouse sufficed to kill it in fifteen hours.

Particularly in order to reach such bacteria as may have penetrated into the lacunæ or chance vascular canals, a much longer action of the antiseptic is necessary, and to be perfectly certain that we have accomplished our object, we should have recourse to boiling water.

Cosmos.

FORCED RESPIRATION OF OXYGEN.

Dr. G. E. FELL, of Buffalo, records in the *Journal of the American Medical Association*, June 6th, 1891, two interesting cases in which forced respiration of oxygen was used to combat the effects of overdoses of morphine. In the first case forced respiration by means of a face mask was first tried, but without much success. Tracheotomy was then performed, and continuous forced respiration maintained through the tube. With the sole exception of the still contracted state of the pupils and the absence of cyanosis, there were at first no signs of life observable. The pulse and heart beat were quite imperceptible, but little by little they returned, and after twelve or fourteen hours of uninterrupted forced respiration the patient had so far recovered as to be able to breathe for herself, and she ultimately made a good recovery. In this case Dr. Fell observes, "artificial respiration would at no time have been of any avail to the patient." The second case was similar in some of its features. The face mask had again to be abandoned in favour of respiration through a tracheotomy tube, the gas being found to pass into the stomach and bowels as well as into the lungs. Improvement was noticed for a time, but an unlucky act of vomiting was followed by the entry of solid matters into the lungs and sudden cessation of the heart's action. The amount of labour entailed in the maintenance of this continued forced respiration is described as very great, and only possible by the help of "an army of students."

(*British Medical.*)

PLASTIC BASES AND PINLESS TEETH.

By W. S. CURTIS, West Randolph, Vt.

IN presenting this subject before this society at this time, I do not expect to say anything new or novel, but will try and explain in a very brief manner the merits of the tooth I am now using in my business almost wholly. After you have heard of its merits, I shall expect you to point out its demerits. As its demerits are what I am after, in order that they may be overcome by some change in the construction of the tooth.

In presenting this tooth to you, I shall not claim it to be the *ideal tooth*, or anything near what we hope may be produced in the near future, by some one in or out of our profession. No matter from whom it may come, only that we get the right thing. But I do think this tooth possesses many qualities needful to prosthetic dentistry, not to be found in any other tooth of which I have any acquaintance.

It is well known by most of us that some cheap and inexpensive material must be used in the construction of a very large proportion of artificial dentures. It is the demand of the age in which we live that the large majority of patients for whom we are called upon to serve in that capacity, be furnished with artificial dentures in harmony with their resources for paying for same. It then becomes the duty of the dentist to provide for them a denture possessing as many good qualities as possible consistent with the price paid for the same; and the better the denture produced at any given price with the least trouble and expense to the dentist, the more satisfactory it will be to both dentist and patient.

A plastic base seems to be the only material upon which teeth can be mounted that comes within reach of a large majority of humanity who have been so unfortunate as to lose their natural organs. Without this many must do without teeth or the dentist must be subjected to the inconvenience of collecting large bills from poor patients; lose the entire bill many times or positively refuse to do their work upon any terms whatever other than cash. Either of which in many cases is extremely unpleasant.

Now, then, as a plastic base seemed to be a necessary factor in our profession, the next essential is a tooth so constructed that it shall possess the entire strength of material used, adaptable to all cases with very little or no grinding; and possessing the required amount of anatomy.

It is well known that a gum tooth cannot be made to harmonize with the features of the average patient as readily as a plain one, and when done is attended with more or less labour and vexation not encountered when plain teeth are used. Therefore I confined myself to the construction of a plain tooth, as the quickest and best way out of our present difficulties attending the construction of a denture upon a plastic base. I herewith present you with a tooth that can be made in such a variety of lengths and sizes, as to be adaptable to all full cases without any grinding whatever, *a condition to be appreciated*. For grinding teeth is attended with no little inconvenience, as we all know. When teeth are properly adjusted in the average month, at the present time, and are usually weak and unsatisfactory at that.

The tooth when mounted rests on a solid base, and is so constructed that the material has been made to flow around it in the process of moulding, always wedging itself into a smaller space, thereby filling every point, and when done, each tooth while separated from the other cannot become displaced without displacing the tooth on either side of it. Therefore each tooth is virtually sustained by the entire strength of material required to hold three teeth in position, which makes, as you will see a very strong attachment.



FIG. I.—Shows construction of retaining cavities in the pinless teeth.

The tooth also has the form of a natural organ upon its palatal surface, which admits of the natural incline towards the hard palate, so essential in maintaining the proper tone of voice. The absence of pins is also a great feature in point of strength. Who of us who have used plain teeth have not suffered grief and annoyance time and again by having a tooth break where the pins were inserted, most surely its weakest point. This tooth can be used with any and all plastic bases. Also with all plastic attachments upon a metallic plate with equal satisfaction, and with all cast metals used for bases. The outside or buccal portion of the tooth can be made thin at the neck to extend well up under the lip, where any great amount of absorption has taken place, and the

natural curve of the festoon of the gum will cover the attachment between the teeth, thereby disguising its artificial appearance. Where there is not sufficient absorption of tissue to admit of any extension of porcelain above the ridge. Of course, we cannot use a gum tooth, and must necessarily use a plain tooth with a very short bite. When pins are used, the shorter the bite the weaker the tooth becomes, whereas with this tooth, the shorter the bite the stronger the tooth and attachment. As in short bites, the point of leverage is brought nearer its base with a consequent increase in thickness of porcelain. As short bites with pin teeth have been attended with many difficulties, such as being required of necessity to make the teeth describe too broad an arch, especially the bicuspid, in order that we might have sufficient porcelain about the pins for strength.

This one difficulty has caused the construction of many a denture, the prominence of which, when inserted in the mouth became so conspicuous that its artificial appearance was easily recognized by all with whom it came in contact. But as such dentures depended upon pins for attachment, and porcelain surrounding them from strength, we could not grind it all away, hence we did the best we could with the material we had to do with.

But as this tooth is not dependent upon pins for its support, it can be set under the ridge or outside and the strength is the same.

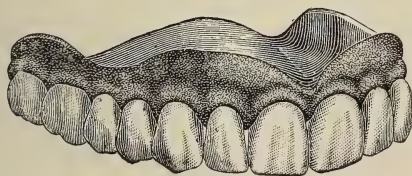


FIG. 2—Shows case completed.

Therefore it must be obvious we have gained a good point here. I have used this principle of attachment with difficult short bites upon bicuspid, for more than fifteen years, and have never had to my knowledge one tooth so constructed, break or loosen from the plate in all that time. This would surely be considered a favourable record for short bites, and the success so obtained led me to enquire, why not make them all that way? Of course, we cannot abandon pins in all cases

as they must be used in many partial cases, but when they can be dispensed with, this method seems much more preferable. Should a tooth be broken by dropping of the plate or any other accident, it can be repaired as easily and quickly as a pin tooth by any method now adopted for such repairing. But I am pleased to say, that in all the time I have used these teeth I have never had a broken tooth from any cause. I wish I could say as much for pin teeth.

ELECTRICITY IN DENTAL PRACTICE.

THE *Electrical Review* (our American contemporary) of the 27th, ult., contains a short article on "Electricity in Dental Practice," by S. B. Palmer, M.D.S., in which the writer, after glancing in a few words at the "benefits which dentistry has received from the introduction of electrical appliances, holds out promises of far greater and more lasting benefits than the profession has been able to give because even the rudimental teachings of electricity has not been required in dental education ; *with less than this the points which here follow cannot be discussed or appreciated.*" (The italics are ours.)

These glad tidings would be almost sufficient to take away our toothache, which proverbially leaves us at the dentist's door ; and all mankind (for who does not or has not suffered from his teeth) will rejoice at this "*annunciation.*" Electricity has come to the rescue, "*and has in store for coming patients*" (if they will only come to Mr. S. B. Palmer, M.D.S.), every advantage that a "*rudimental*" science can offer them.

"Electricity in Dental Practice" endeavours, however, to ascend beyond such rudimental teachings. The writer ventures on higher grounds of "potential."

"We will consider," he says, "the effects of electric potentials between fillings and such electrolytes as come in contact with them in the mouth, be it softened tooth-structure, food, or fluids, *under the head of Electro-Dental Physiology and Therapeutics, better known in the profession as the Electro-Chemical Theory.*" Yet he has his misgivings about the possibility of raising his readers' minds to the scientific higher position from which he announces his theory, for "the writer well knows the difficulty of presenting the one word

potential in a manner to be understood by those *who know not the rudiments of electrical science.*"

Now all this seems grandiloquent language, which appears in its proper light, when considered in connection with the rest of the article, the gist of which is : The respective merit of gold or amalgam for filling hollow teeth ; and the writer, to give himself an air of intellectual superiority to teach us rudimental science as applied to tooth-stopping, prostitutes the science, or, better, the name of electricity, without evincing the slightest degree of a true knowledge of electrical phenomena and their laws.

"The most prominent points" (of the electro chemical theory ?) "consists in this : That the saliva of the mouth, the condiments, &c., sustain the relations of a battery cell with its fluids. When any metallic substance is placed therein, it, as in ordinary cells, has its potential or polarity, be it a plate or a filling, whether the current is constant or intermittent, or whether it be injurious or not, &c." Now the merest tyro in electrical science will at once see that such special conditions, as are required to obtain an electric current through chemical action, do not exist here ; that the action of any acid or alkali in the saliva, or the food, on the gold, that *might* happen, is of a simple chemical nature, and it is questionable if the conditions for an electric current exist, even if the lining membrane of our mouth were as hard as that of the Russian sailor's, who enjoyed a glass of sulphuric acid which had been given him in mistake for strong brandy. However, we are, perhaps, too rash in our assertion ; we evidently have to learn the rudimental teachings of electricity to bring ourselves to the level of the author's ideas and his knowledge.

"*By cultivation and observation, currents are readily detected between gold and other metals when not in the same teeth*, so to speak ; the mouth furnishes a galvanometer almost as sensitive to taste as that of the '*frog's leg*' is to sight. When the tongue bridges over or closes the circuit from fillings of different potentials, work is done on the line." But if anyone should declare that he has not "*cultivated* sufficiently to observe the current, the author answers : "Patients cannot describe the symptoms ; none but an electrician could *diagnose a case, nor can the subject be discussed by those having no experience.*" Verbum non amplius addam.

Looking at the subject from a physiological point, it would not be difficult to show how the author overlooks the chief factor in the production of decayed hollow teeth, which is at work before any metallic filling enters a tooth, and continues to do so, whether gold or amalgam is employed by the "*older members of the profession*" or by Mr. S. B. Palmer, M.D.S., on his "*Electric-Dental-Physiology and Therapeutics*," better known by the profession is the "*Electro Chemical Theory*"—*System*.

The author finishes his dissertation by declaring that he "claims no honours for the advanced position set forth. The object of appealing to the *Review* is to protect the dental profession against false positions in electrical science, &c." But, we may simply ask, who places the dental profession in a false position in electrical science—if not the author himself?

The indiscriminate use of such words as potential, electro-dental, electro-chemical theory, &c., reminds one of Goethe's saying:—

"Denn eben wo Begriffe fehlen
Da stellt ein Wort zur rechten Zeit sich ein
Mit Worten lässt sich kräftig streiten,
Mit Worten ein System bereiten."

Electricity is making strides ; beside the electropathic belt we shall now have electro-chemical-tooth-stopping.

Electrical Review.

SENSE OF SMELL LOST BY THE USE OF COCAINE.—One of my patients, after suffering some time from neuralgia, which seemed to radiate from the nose, applied to a physician for relief. He recommended a solution of cocaine to be snuffed up the nose several times daily. After using as directed for a couple of weeks, she was surprised one day to find that she had lost the sense of smell, which has never returned.—J. F. WESSELL, D.D.S., Philadelphia, Pa.

Cosmos.

TWO CASES OF SUBMAXILLARY CELLULITIS RECOVERY.

(Under the case of Mr. MORRANT BAKER.)

THE following cases illustrate well one special type of submaxillary cellulitis, often called angina Ludovici. In the type referred to, the cellulitis, although extensive, is still limited to the submaxillary region, and with more or less well defined boundaries. It has not, as in the other type, extended to the tissues generally of the neck or the upper part of the chest, and has not led to the extensive sloughing which in itself constitutes a great danger; but if not relieved the dangers of extension to the region of the larynx, with difficulty of breathing, ending in asphyxia and death, are probably equally great, or even more so, and it is all important that the relief should be given early by incision. The second case illustrates the necessity of early interference with the knife, even before the formation of a definite collection of pus. In both there was trouble with the teeth, and a breach of surface existed in the gum before the inflammation under the jaw commenced. They illustrate also the benefit of surgical treatment in a condition which, if neglected, only too frequently proves fatal, either in the way already mentioned or from blood poisoning. For the following notes we are indebted to Mr. J. H. Maund, house surgeon.

CASE 1.—W. K.—, aged thirty-seven, was admitted to the hospital on Feb. 11th, 1891, suffering from a large swelling in the neck. On Feb. 8th the patient suffered from toothache; on Feb. 9th and 10th he had some teeth extracted. There was slight swelling round the jaw on one side when he had the first tooth extracted. This increased, and extended across the throat to the other side by the 11th. His throat became very painful, and swallowing difficult. On admission the patient had a large hard swelling of all the tissues in the submaxillary region, extending from the lower jaw to the thyroid cartilage, and laterally to the parotid region on both sides and the adjoining portion of the face. The swelling was very tense and painful; fluctuation doubtful. The mouth could be opened only to a slight extent, nor could the tongue be protruded. The mucous membrane of the floor of the mouth, red and œdematous, was pushed up to the level

of the lower teeth. The voice was somewhat croupy, and the patient could swallow only with difficulty ; he made frequent attempts to rid himself of the thick mucus accumulating in the mouth by expectoration. Chloroform was administered, but the administration of this required great caution, as some difficulty of breathing, as if from laryngeal obstruction, occurred. Under the direction of Mr. Baker, Mr. Paton, house surgeon, made an incision through the skin about an inch in length in the middle line immediately below the chin ; and after penetrating for some distance with the knife this was laid aside, and the wound deepened with a steel director. It was not, however, until a forefinger was introduced for almost its full length that the abscess cavity was reached, and about three ounces of horribly offensive pus let out. A wire drain was used, and boracic fomentations applied. Fluid diet was ordered. The temperature on admission was 102.8° ; this fell after the incision to 99.2° . The day after operation the swelling had greatly decreased; the patient was able to protrude his tongue a little, but still spat up a quantity of phlegm.

Feb. 18th.— Has had some pain over the left parotid. Now takes minced chop and mashed potatoes. Swelling almost gone; very little discharge ; drain removed. He left the hospital well on Feb. 25th.

CASE 2.—T.H.—, aged fifteen, a bottler, was admitted to the hospital on July 2nd, suffering from a large swelling under the chin. On June 26th he suffered from toothache. This continued for two days ; he then had his gums lanced. On June 30th the swelling below the chin began, and increased rapidly in size. On admission the patient had a large, tense, elastic swelling under the chin, extending from the lower border of the inferior maxillary bone laterally to the angles of the jaw on either side and downwards to about the middle of the thyroid cartilage. The skin over the swelling was red and hot, the swelling very tender and painful. The floor of the mouth was raised to the level of the top of the teeth, and the tongue pushed upwards against the hard palate ; it could not be protruded beyond the teeth, nor could the mouth be opened to any extent. The second lower molar on the right side was loose. There was some slight difficulty of breathing : the breath was very foul-smelling. Temperature 100.8° . An anæsthetic was administered the same afternoon, and under Mr. Bakers direction Mr. Maund made an incision in the skin, in the middle line and between the chin and the

hyoid bone over the most prominent part of the swelling. This was deepened partly by the knife and partly by a closed pair of dressing forceps until the mucous membrane of the floor of the mouth was reached, as felt by the finger applied to the floor of the mouth below the tip of the tongue, the teeth being separated as far as possible by a gag. No pus escaped ; there was little bleeding. A wire drain was used and boracic fomentations. The patient was ordered a fluid diet and two ounces of brandy. The temperature rose to 102° at 7 P.M., and the swelling seemed to have increased a little downwards. At 10.30 P.M. the patient had a slight attack of dyspnoea, which was relieved by the administration of an ether draught. Did not sleep till 1 A.M. after fifteen minims of tincture of opium.

July 3rd.—Temperature 99.8° , edges of wound sloughing ; thin serous discharge ; breath still very foul smelling.

6th.—Sleeps and takes food well ; swelling much less ; a little pus escapes from the wound, about half a teaspoonful in twenty-four hours ; wound healthy ; expectorates a great deal ; temperature subnormal.

10th.—Swelling much less ; wire drain removed. Can protrude tongue ; breath sweet ; has expectoration. Fomentations left off and a pad of Gamgee tissue put under the chin. Takes solids.

On the 12th the swelling had gone ; wound almost healed. The patient felt quite well, and on the 15th he was discharged well.

Lancet.

CHLORIDE OF METHYL AS A LOCAL ANÆSTHETIC.

Dr. S. E. BEREZOVSKY (*Letopis Khirurgicheskaho Obschestva V' Moskve*, December, 1890) describes experiments on dogs which he has made with the object of testing the anæsthetic action of chloride of methyl, as well as its effect on various animal tissues. The substance was used in the form of a spray. The experiments showed that : (1) a spray of two seconds' duration, when directed against intact integuments, produces complete anæsthesia lasting from fifteen to twenty seconds, the tissues remaining sufficiently soft to allow cutting ; (2) a spray of five seconds' duration, while inducing a somewhat longer anæsthesia, freezes the skin to an inconvenient degree ; (3) a seven-seconds spray gives rise to con-

secutive local congestion and inflammation : (4) a twenty-seconds' spray causes sloughing of the tissues down to the muscular layer ; (5) a convenient and harmless anæsthesia induced by two seconds' spray, can easily be prolonged up to five minutes by repeating the spray at short intervals ; (6) sufficient anæsthesia of exposed bones can be produced in the same way ; (7) the spray does not cause either gangrene or thrombosis of blood vessels. The author next employed chloride of methyl (a spray of two seconds' duration, repeated according to the necessities of the case) as a local anæsthetic, in a long series of operations, such as circumcision for phimosis (4 cases), removal of elephantiasis of the prepuce (1), evulsion of toenails (2), excision of cancer of the lip (2), and atheroma (3) large post-auricular dermoid (1), incision for empyema (2), scraping out tuberculous ulcers and fistulæ, etc. The results were invariably most satisfactory, the operation being in all cases absolutely painless from the beginning to the end, while the healing of the wound left nothing to be desired, even in badly nourished patients. The only disagreeable effect was a burning sensation at first ; this, however, quickly gave place to complete numbness of the area sprayed upon. On the whole, the writer concludes that the chloride of methyl spray can be employed in all cases where an ether spray is used as a local anæsthetic ; and that the former should be preferred to the latter, since (1) it induces anæsthesia "incomparably more quickly" than ether spray ; (2) chloride of methyl is unflammable, and hence can be safely employed in cases of cauterisation, etc. ; (3) it does not undergo any change from exposure to light or air ; (4) it does not irritate mucous membranes even in children ; and (5) it is cheaper than ether, since only very small quantities are required.

British Medical.

PREPARATION OF CAVITIES.

By C. N. JOHNSON, L.D.S., D.D.S., Chicago.

It would scarcely seem judicious to lay particular stress upon any one part of the operation in the process of filling teeth as requiring more care than another. Every step in the process has an importance all its own, and neglect of any detail is likely to prove disastrous to the operation. And yet I am inclined to the opinion that a greater number of failures

result from imperfect preparation of the cavity than from any other cause. The longer I operate, the greater length of time do I find myself spending on the preparation of the cavity in relation to the time spent in the entire operation. There are so many things to be considered when a cavity is being prepared that it is more or less of a tax on the operator to get everything in a perfectly satisfactory condition.

It is not enough simply to make the cavity of such a shape that it will retain the filling, nor is it sufficient that we remove all decay and drill out all fissures. Important as these matters are there is a final step in the preparation of cavities which is too often almost entirely overlooked or at least held in so little concern by the operator that special attention is not paid to it and an otherwise well prepared cavity is left with a defective feature which sooner or later results in failure of the filling. I refer of course to the treatment of enamel borders. This part of the subject is worthy of a somewhat extended paper in itself as is evidenced by the articles of Dr. Black, in the January and February numbers of the *Dental Cosmos*. I am sorry that this series of articles are not completed at the writing of this paper as it would relieve me of anything but the mere mention of the subject. As it is I can do no better than to refer you to the ones already published and to those which may follow in the same line.

Cavities as considered in relation to their preparation may be divided into three general classes, viz. proximal, grinding surface and buccal, labial or lingual. The three latter may be considered as one class, their treatment in preparation being practically similar.

In dealing with proximal cavities the first requisite is space. This question of separation was considered by the essayist who read a paper a month ago, and may be dismissed by me with the remark that I am in favour of gaining plenty of space before operating.

If the cavity is in a molar or bicuspid it will under ordinary circumstances be necessary to open it up to the grinding surface so as to make a compound cavity of it. Usually these cavities do not manifest themselves to the patient or operator till the grinding surface is so much undermined as to make it unsafe to leave it, especially if there is another tooth standing in line to hide the proximal decay. Even in some cases where the grinding surface is reasonably strong it is deemed the best

practice to break it down to facilitate the operation. Where there is a tooth standing next to the decayed surface it is usually difficult to gain sufficient access to the cavity from the buccal aspect to make sure of a good operation, and even if a good operation may be made there is another consideration which favours wide cutting. It is termed by Dr. Black "extension for prevention" and means a broadening of the cavity to bring the line between filling and tooth away from the point of greatest liability to decay. Of course it is not advocated as an invariable rule to open up through the grinding surface wherever there is proximal decay, but in the weight of judgment, the balance should usually swing in that direction. In cases where there is no tooth in line to prevent examination of the surface a cavity is usually detected earlier in the process of decay and there is less danger of the grinding surface being undermined. The operator also has such perfect command of the cavity by reason of there being nothing in the way that it is never necessary to break down the grinding surface to gain access. This form of proximal cavity is one of the simplest we have to deal with. The principal points in its preparation are a removal of the decay, a deepening of the cavity at opposite corners to secure retention of the filling, and a careful bevelling and polishing of the enamel margins.

In a compound cavity the first step after dryness is secured is to break away all weak or overhanging walls, and in this connection we may consider that a wall is weak when there is any indication that it will be fractured by the strongest force that mastication is likely to bring upon it. Walls that should be broken away are often left standing through lack of judgment in one particular. The operator argues that if mastication has not already fractured them there is little danger that it will do so when they are supported by filling material. The fact is lost sight of that a tooth with a carious cavity is usually sensitive, and the patient in masticating intuitively avoids chewing anything hard on it.

Thus a tooth may stand in this condition for an extended time with weak, overhanging walls. As soon as the cavity is filled and the tooth made comfortable for mastication, the patient uses it and the consequence usually is another wreck added to the long list of failures in dental operations. It is no indication that a wall is strong simply because it is found apparently standing guard over a cavity.

In breaking away these walls a chisel is usually best for the rougher part of the work. The chisel should be sharp and a light tap given it by the mallet instead of hand pressure. It is less unpleasant to the patient to submit to a sharp decisive blow of the mallet than to have the enamel ground or rasped away by hand pressure.

This grating at the enamel margins with the chisel is very distressing to most patients, and coming as it does, in the beginning of the operation is likely to unnerve a sensitive individual throughout the whole sitting. In fact there are some patients who thus early in the operation can ill submit to the use of the chisel at all, and in such cases we must use other means for trimming away these walls. This can often be done quite readily where the cavity already extends to the grinding surface, by the use of coarse sandpaper discs in the engine. The overhanging enamel approaching the cusps may be trimmed off by this means quite rapidly and with little or no shock to the patient.

In cases where the grinding surface wall has not been broken in it is usually quite difficult to fracture it with the chisel on account of the strong arch of enamel overhanging the cavity. To facilitate matters a small sharp drill should be used in the engine and a slot cut through the arch of enamel running from the fissure between the cusps on the grinding surface to the ragged edge of the overhanging enamel border on the proximal margin. This destroys at once the integrity of the arch much as if its keystone were suddenly removed, and the enamel may then be broken down with the slightest tap of the mallet.

The operator should avoid as much as possible giving the patient any undue shock in the early part of the sitting. With a nervous individual in the chair a careless blow of the mallet in breaking down enamel will render the patient unsettled and apprehensive during the whole operation, and a patient in this condition proves very trying to the operator. To operate on one who is always expecting to be hurt and whose eyes are continually endeavouring to follow the instrument in the operator's hand is annoying in the extreme, and cannot fail diverting the attention of the operator to a degree that prevents a due absorption in the work.

After the overhanging enamel is broken down the next step is the removal of all decalcified dentine. This should be done thoroughly if there is no likelihood of the pulp being exposed,

and just here occurs the necessity for a perfect knowledge of the probable location of the pulp in each individual tooth. This matter has not heretofore received enough attention in the instruction of dental students, and I consider it as the most important among the many other good things taught by the present system of operative technics. It is important in view of the extent to which the dentine is saturated with deleterious agents for some distance from the actual decay that as much of the infected tissue be removed as possible short of encroachment on the pulp. But if the pulp be nearly exposed it will usually remain more comfortable if a layer of partially decalcified dentine is left over it, and this treated antiseptically in the manner with which you are all familiar.

The next step after decay has been removed is to shape the cavity for the retention of the filling.

This can ordinarily be done to better advantage in most cavities with the engine, though there are occasionally cases where properly shaped excavators will be found serviceable. It goes without saying that all burs, drills, excavators, or other instruments used in the preparation of cavities should be sharp. There is no other form of imposition practised on a patient that is of so cruel a nature as the use of dull, blunt instruments.

Dental Review.

To be continued.

Dental News.

DEATH FROM METHYLENE.

An inquest was held at Carlisle on the 31th of August before the Coroner, Mr. Hewetson Brown, on Mrs. Oxley, 27 years of age, wife of an inspektor on the Caledonian Railway, who died on Saturday while under the influence of methylene. The deceased went on Saturday last by appointment to Mr. Parker, chemist and dental surgeon, to have her teeth extracted. Her husband accompanied her, and by arrangement Mr. Parker, before performing the extractions, proceeded to administer three drachms of methylene. The patient had not taken more than half-a-dozen inspirations when she moaned and fainted. Mr. Parker finding her pulse failing, used restoratives, but without success. Medical assistance was sent for, but the woman died within half an hour. The post-mortem showed that death resulted from asphyxia.—The Jury returned a verdict of death while under the influence of methylene properly administered by a qualified dentist-surgeon.

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A CASE OF REPLANTATION.

By Mr. J. L. ROBERTSON, L.D.S. Eng., of Cheltenham.

THE following case of replantation may perhaps be interesting to some of your readers, as though considered hopeless from a medical point of view, it turned out to be the reverse. †

In May 1889, Miss L., 15 years of age, a pupil at the Ladies' College here, having been home for the short Easter vacation, underwent a course of dental treatment. A large number of teeth having been filled, among them the two centrals which were very nicely done with gold on each side.

A few days after, a hard swelling was found to be forming beneath the nose. Not being able to go back to the dentist, who had done the work, the patient delayed being attended to till she came back to school. In the meantime the swelling increased, and when she came to me the face was much disfigured, the upper lip being very everted, almost hiding the nostrils. On examining the mouth a sinus was found to exist over the right central, both centrals being extremely loose, especially the right; the slightest movement of the lip causing a profuse flow of watery pus. The probe could be passed up the sinus to the floor of the nasal cavity where rough bone could be distinctly felt. There being no time to be lost, after a consultation with the doctor, who was present to give gas, and who advised the removal of one of the centrals, if not both, on account of the apprehended dead bone, I decided to obviate the need of a plate by extracting the right central and replanting it, and I did so. The end of the fang was cut off, a very foul smelling dead nerve removed, per apical end of root, the tooth and socket rendered antiseptic with a solution of phenate of soda and the nerve cavity filled with a tight filling platina pin. The left central was simply drilled to allow escape of gas and pus and left to after treatment.

Having previously taken an impression in godiva, in a small tray, removing it from the tray and trimming it down into a cap (not having time to make one in vulcanite) fixing a small piece of Dental Alloy on the lower border to catch the edges of the lower teeth, the tooth was replaced, the cap inserted, and the patient sent home with her mouth bound up, with orders that the bandage was not to be removed till I called to see her six hours later. On calling, the case did not look promising, the patient's face was flushed, rigors frequent. To allow of some nourishment being taken and to wash the parts, I removed the cap, when out came the tooth as well, the cap fitting too closely, this brought on profuse hæmorrhage, which lasted for some time. When this had ceased and some beef-tea had been taken, the tooth being in solution of phenate of soda meanwhile, having eased the cap around tooth, except on the cutting edge, the tooth and cap were replaced, a cooling draught given (though the bleeding seemed almost immediately to remove the rigors) and a carbolic mouth wash to be used without removal of cap.

On calling again the next morning, a better state of affairs appeared, the cap could be removed, the tooth was setting though naturally still very loose. Slop diet was ordered and frequent application of the lotion, the cap to be removed by patient for the purpose and replaced afterwards. I was to be sent for if any pain or discomfort ensued. My services were not required.

Three days afterwards, the patient again called on me, the mouth was free from pain, the tooth was quickly tightening, and use of cap discarded. I then drilled into left central from the lingual surface, removed a dead nerve, which was very putrid. Treated tooth antiseptically for a few days and filled with gutta-percha with Iodoform and eucalyptic dressing-root. Within ten days the right central was healed, not tender to touch and very soon after could be used in mastication, though a small sinus still showed on outer surface of gum, into which a probe could be passed a long way and rough bone still felt.

Six months later, the left tooth became tender to bite on. I accordingly removed gutta-percha dressing and again treated similarly. Three months later filled left tooth permanently, a sinus still existing over right but very minute. I occasionally saw patient from time to time, and found the right central as firm as any tooth in the head, but the sinus in the same state.

The left central though all right to look at and useful for biting, is slightly loose.

Two months ago, the patient called on me saying something was scratching her lip; on examining the mouth a spicule of dead bone about one-eighth of an inch long, triangular in shape, had worked down through sinus and was protruding from it, this I removed and within a week the sinus closed and I do not think anyone could now tell that the tooth had been treated, the colour is good and the stoppings *in situ*. A number of other cases, which I have done, are standing very well, but in none of them was the diagnosis so unfavourable or the result better. I think the cause of the trouble in this case was, that the teeth were too quickly separated for filling, first mesially and then distally, which brought on inflammation and subsequent death of the pulps.

GOLD CROWNS.

By APPLEBY KING, L.D.S.I., Margate.

THOSE who would put on a gold crown quickly and well may succeed by following these directions. Take a piece of thin wire (not too thin), and then with a pair of pliers twist it round the stump to be operated upon, then slip it carefully off and paint it black; now take a piece of stick of some hard wood, something like a rivetting hammer handle, selecting the stick according to the size of the band you require, put it in the vice now while the paint is wet on your shaped wire ring describing the exact shape of the stump, place it on the top of the stick you have in the vice and give it one sharp blow with the flat end of a good sized hammer, take away your wire, now shape your piece of wood carefully and accurately as the dark mark guides you, until the whole of the dark line disappears, mind you are inside the line, but do not go too far; now make a ferrel of coin gold for the top of your stick, polish and finish on the stick, then take it off and try it on the stump, and you find it a little too small to go on, take a sand paper disc, and with the engine rough it all round and make it fit on "slic," this being done place your ferrel again on the stick and make another ferrel to fit over it, as you would proceed to make a lid to a box. Now you

have a telescope joint; take off your second ferrel, or collar, and fix on the stump with osteophosphate, having arranged your gold crown to the articulation with strong wax, remove it, and solder your second collar on the crown and polish, fill your gold crown with copper stopping, and then, as a lid fits on a box, your patient bites the crown into its place, and remove it if you can. In fitting porcelain teeth for the front in this way, the great trouble will be in getting the pin in the proper position. Drill out the nerve canal, proceed as before, when you have your first collar on, fit your pivot *in situ*, and cut a small piece of platinum gauze the shape of the collar, and drop it inside, touching the pin, force in some resin wax, and bring out the gauze adhering to the pin, now set it in plaster and powdered pumice and flush some solder over to fix the pin, then a piece of gold plate, having made your second collar, solder the gauze now filled in with plate, and solder to collar No. 2; on this arrange your porcelain tooth in the mouth, and solder it to second collar; your first collar now being fitted to the stump press it all into place with osteophosphate. I shall be pleased to give any information to anyone not understanding these instructions by writing to me.

CUTTLE FISH BONE FOR DIES.

EDITOR ITEMS :—I read some time since, but where I cannot now recall, an article which said that jewellers sometimes employ the cuttle-fish bone, in common use for birds, as a matrix for reproducing small articles of jewelry, etc., the article being firmly pressed into the cuttle-bone, leaving a beautiful impression of the object, into which the metal was poured. I immediately thought it would be useful for small dies in crown and bridge work, and having tried it, must say it makes the most beautiful and perfect impression of anything I have ever used, and I wish to call the attention of the profession to it. Shave the bone till a flat surface is obtained into which press the crown firmly. Remove the crown and over the impression place a small piece of brass tubing, the diameter and height you wish your die. Pour in some melted Babbitt's metal, and when cold you will have a perfect die, the making of which has not taken over five minutes.
Frederick H. Lee.

Items of Interest.

British Journal of Dental Science.

LONDON, SEPTEMBER 15th, 1891.

TO THE STUDENT.

IN other pages of this issue, the student will find all the information he needs concerning Hospitals and their classes. We have in previous years pointed out some of the considerations which should actuate a man in the choice of his Hospital and given such advice, as we were able, concerning the Student's curriculum. The educational question is one ever before us. Education is the motive power of professional life. As the child is educated so does the man live. To alter, amend, improve the professional man and his doings one should, and must, commence with the professional child, *i.e.* the student. It is impossible, therefore, to choose a subject for comment which is more applicable to this, an educational, than to any other number, but it might not be amiss to point out what are, in our opinion, the objects of an ideal education and to what the student should endeavour to attain. We suppose there are few men, whatever be their calling, who do not start with high ideals; even those who may appear most casual are often found to be striving, in their way, towards a high standard of perfection. Life without a purpose is but a poor thing, and there are probably few men who are absolutely purposeless. But the trouble is to choose the right purpose, and, having chosen, to attain the end. The purpose of a Dental Student is, we take it, to educate himself, so that he may in time be able to practise his profession with credit to himself and benefit to his fellow men. He sets out with

the object of attending so many lectures, of doing so much reading, of learning to use his fingers in the various manipulative dental arts, and lastly to pass an examination which shall entitle him to a diploma enabling him to practise that which he has learnt.

There is no sudden break between the mechanical work, which has occupied his attention during the pupilage, and the studies and practice at the Hospital. The latter is but a development of the former, it is but a step higher. The finger training which he has begun is but continued and developed in a different direction, and though he may not have paid so much attention to the theoretical side during the pupilage, he should, and no doubt has, in some measure prepared himself for a more intimate study of the subject at the Hospital. But the points, which, though often overlooked, are yet among the important, if not chief, ones, towards which he should now direct his attention, are the formation of a sound judgment as to what is the line of treatment required in each particular case, and the art of understanding and managing his patients. It is one thing to know how to do a thing, it is another to know when to do it. The success of a practitioner must depend on this neatly balanced judgment, and although it may be possible to gloss over mistakes, though the end may be about the same whichever line of treatment be adopted, there is undoubtedly in most cases a right course and a wrong. It can hardly be necessary to illustrate these remarks, but it would be easy to do so from the treatment of irregularities of the teeth or from considerations connected with the insertion of artificial dentures. This judgment can only be attained by some lengthy experience, and by carefully noting the effect of a varied treatment in different cases, though the student should not be slow to profit by the experience of others. Perhaps, of the two, the treatment of patients is the more difficult to acquire, and it is well to insist that this experience should be commenced at the Hospital, and not postponed till a man enters private practice. What is the desire of the operator? It is to gain the confidence of

the patients, and to impress them with a sense of trust that that which is being attempted is done rightly and well. This can be learnt as well with a poor person attending a charity, as with a wealthy private patient, and certainly the feelings of the two, and the desire for consideration is equally prominent in both. If there is one thing which a man of truly professional spirit abhors, it is having one manner for the poor and a second for the rich. The student should remember that during his Hospital career he will have to do with the poorer classes, people with whom this world has not dealt kindly, people who have been slighted and put upon in many ways, can he wonder that they should be even more desirous than their richer brethren for kindly sympathy; more apt to imagine a harshness of manner where none is meant. It should be the object of the student so to conduct himself towards these patients as to gain their confidence, and he may rest assured that the cultivation of this habit will stand him in good stead when he enters private practice.

Merely learning his work is, however, not the sole aim with which the student should set out on his hospital career. He should remember that he has but a sorry outlook before him if he does not also learn to take an interest in his profession so that it may become to him something more than a mere moneymaking agency, that he may find in it something which shall call into play those higher feelings which elevate the daily work above mere drudgery.

Abstracts of British & Foreign Journals.

PREPARATION OF CAVITIES.

By C. N. JOHNSON, L.D.S., D.D.S., Chicago.

(Continued from page 816).

The shape which is to be given the cavity must be governed largely by the case in hand. The most that can ever be done in a paper like this is to give a few general rules and even these are subject to modification in individual cases. In shaping for retention where grooves are necessary they should be drilled with a view to obtaining the greatest amount of strength to the filling and walls of the cavity, consistent with care against encroaching on the pulp. It may be laid down as a rule that a filling cannot be fastened in too securely, so that where there is a degree of doubt as to the amount of retention required let the decision fall on the safe side and choose the alternative of getting more retention than seems absolutely necessary rather than take the chances of having not quite enough.

Usually the most desirable places for drilling grooves in these proximal cavities are along the buccal and lingual walls with rather a deep depression in the cervico-lingual corners. In bicuspsids the fissure between the cusps will usually be so defective that as a preventative against future decay it will be necessary to drill it out, and in some cases even if decay is not probable it is good practice to cut fissure for the purpose of assisting in the retention of the filling. In these teeth it is sometimes difficult to get secure anchorage along the walls an account of the small bulk of sound, firm tooth tissue, and in those cases it is better to take advantage of the fissure for the purpose of making a "staple" to the filling at this point rather than run the risk of encroaching on the pulp or weakening the thin walls of the cavity by drilling deep grooves along the sides.

Operators sometimes hesitate to drill between cusps through fear of weakening the tooth and rendering it more liable to split, but in any case where a fissure is at all perceptible to the naked eye, or where the finest exploring instrument can

penetrate, the assurance may be had that there is no coalescence of the enamel running down from the two cusps and therefore no strength given it at this point. To broaden the fissure with a drill and insert a good indestructible filling material is to add strength rather than take it away. Of course judgment must be used not to go too deep so as to cut through the sound dentine.

From observation I believe that there is a great lack of thoroughness on the part of many operators in drilling out fissures on the grinding surface of molars and bicusps. These fissures are always a weak point in a tooth and when extending from a cavity should invariably be drilled out to the extreme end. Possibly the reason they are so often left is because it is somewhat tedious to do the work thoroughly, but this should not influence the operator in the slightest degree. I have found no drills in the market at all suitable for this work, and for several years have been using a drill made in the following manner. A worn out inverted cone bur is ground on two sides to a sharp edge on the end, as you will see by those I exhibit. This form of drill will work its way between two strong plates of enamel with an astonishing rapidity. It will facilitate the cutting if the handpiece of the engine is swayed back and forth while the drilling is being done, and with these means at hand there is no excuse for slighting fissures.

The cervicle portion of the cavity requires careful preparation. The floor looking from the cervical border toward the pulp should be as nearly as may be horizontal, if anything dipped slightly in the direction of the pulp. This does not mean that a high sharp ridge of enamel be left standing as is often done. In fact enamel borders should be as carefully treated in this region and others, and though the work is more difficult on account of the position yet it will well repay the time spent on it. It is sometimes difficult to know what instrument may be used to the best advantage for trimming enamel margins in this locality. Probably the greatest number of cases may be reached with a medium sized engine bur, having extremely strong blades such as are cut on finishing burs. These will cut enamel sufficiently fast and be jarred out of place as burs with large blades. If it is found difficult to guide the bur along the edge of the enamel it will be sometimes be practical to let the shank of the bur rest on the cavity at the grinding surface, or on the angle of the proximal

and grinding surfaces of the tooth next in line. This will help to guide the bur and bring it under better command.

As before intimated, the inner angle of the cavity at the cervico-buccal and cervico-lingual corners should be somewhat deepened. This will form a pocket into which the filling may be started and will also prevent the filling from tilting as the cervical portion is being consolidated.

In respect to the outline given the orifice of the cavity, a mistake is often made by leaving the opening toward the grinding surface too narrow. There are several reasons for broadening these cavities. If decay has gone on to any extent the dentine is usually involved in the direction of the cusps, and unsupported enamel should not be left in this region. Then better access can be obtained to the cavity by broadening the orifice, and last but not least we are working on the principle before mentioned of extending the cavity for prevention of secondary decay. To put it in brief, it is safe to claim that broad proximal fillings where the line between filling and tooth is carried well away from contact with the adjacent tooth gives better service than narrow fillings no matter how carefully inserted.

For opening up these cavities and trimming back the enamel toward the cusps I know of nothing equal to a sandpaper disc in the engine. The margins may be bevelled, polished and made symmetrical in a very short time by this method.

In dealing with proximal cavities in anterior teeth we may begin with the same requirement as for molars and bicuspid, viz., plenty of space. The general shape to be given an ordinary proximal cavity in an incisor or cuspid is also governed by the rule which calls for the maximum of strength with the minimum of danger. The main retaining groove should in the majority of cases be drilled along the cervical floor of the cavity an account of the extra bulk of tooth tissue at that point. This groove should be deepened into a corner at the cervico-lingual aspect of the cavity and also to a slight degree at the cervical-labial, though if much of an undercut is made at this point it will call for extra care in adapting the filling. The gold must be carried around the margin of the cavity and well up into the groove with curved instruments which will enable the operator to direct the force of the plugger point against the labial wall.

The facility with which an ordinary plugger will reach the cervico-lingual region by direct pressure, and the greater

amount of tissue covering the pulp at this point, admits of a deeper undercut there than elsewhere. We often see the result of too deep a groove along the labial wall where care has not been exercised in getting the gold well adapted in a discoloration under the enamel. A filling in this condition should at once be removed and a better one inserted, for while the margins may appear perfect the discoloration indicates a leakage somewhere, and proves that there is lack of conformity of the filling to the cavity wall at its inner part.

The object of deepening the cervical groove at the two ends as just mentioned, is not only to retain the filling in place but to assist in anchoring the first pieces of gold in position without the danger of the whole mass tipping as the filling progresses. This does away with the necessity for drilling pits, and just here I wish to make a distinction in terms where there is often too little discrimination used. We hear the term retaining pits used almost invariably when speaking of the little pits drilled in the bottom of the cavity. As I understand this question there is no such thing as a retaining pit. These pits do not retain a filling. If we depended on nothing but two or three of these pits drilled in a saucer-shaped cavity how long would our filling remain no matter what care was exercised in impacting the gold? Invariably the filling would come out, leaving the pits filled with small plugs of gold. There is little or no strength to these minute plugs when lateral pressure is exerted on them, so that they cannot be depended upon for retaining the filling. What then is their office? They are drilled for the purpose of anchoring the first piece of gold in some one place and holding it there while other gold is being added to it. Consequently their proper name is anchorage pits.

When we come to providing for retention of the filling, if the general outline of the cavity is not suitable, we then drill grooves and in this case it is perfectly proper to use the term retaining. I make a plea then for the terms anchorage pits and retaining grooves, and while the terminology is by no means new, yet so many of the profession make no distinction that it is misleading to students and the younger members of the profession.

Now as to the advisability of drilling these anchorage pits. I am so thoroughly opposed to them personally that I hesitate about writing much on the subject for fear of being considered

prejudiced. In the days when cohesive gold was employed almost exclusively there may have been good grounds for their use, but with our present methods of operating I can see no necessity for them. There may occasionally be a case where they are serviceable, but I cannot recall an instance in my practice within the last five or six years where I have thought it necessary or advisable to resort to them. To detail a method of starting the filling without them is not within the province of the present paper.

In securing retention of the filling toward the cutting edge of an incisor, where a good deep groove is possible along the cervical margin, it is not necessary to undercut to any great extent at this point. A good square shoulder with a slight depression at the inner angle of the cavity toward the cutting edge is all that is required. In most cases, as has been intimated, the deepest undercut must be at the cervical margin, and yet there are exceptions to this.

For instance in a lateral incisor with very narrow neck and a cavity quite high up on the tooth, it then becomes dangerous to attempt much drilling in this region if the pulp is alive. In these cases we must secure retention as best we may, and if the cavity does not extend too far down toward the cutting edge we can get a good undercut in the lower part of the cavity, and depend upon that mostly for retention.

In giving outline to the margins of these cavities a mistake is frequently made in not sloping the cavity away enough toward the neck and cutting edge. A somewhat rounded outline is made instead of an oval outline. These round cavities, if decay has been at all extensive, are objectionable for several reasons. An outline cut like this leaves sharp angles to the enamel margins which are usually followed by failure of the filling at the borders. It is difficult to adapt gold against these sharp angles without fracturing the edges of enamel, and even if this could be done successfully there is still better argument in favor of extending these cavities longitudinally. It brings the line between filling and tooth away from the point of greatest liability to decay, and is right in the line of extension for prevention. To do this most successfully and give symmetry to the the margins, where the decay has involved either the labial or lingual walls, a sandpaper strip may be used to advantage.

The preparation of grinding surface cavities in molars and bicuspsids requires little description except to say that the walls

should be made as nearly as may be perpendicular. A cavity with too much undercut is in danger from breakage of the overhanging walls, and a cavity left saucer shaped will not retain the filling. If a deviation is made either way from the perpendicular it had best be in the direction of making the cavity slightly broader at the floor than at the orifice. It is better to be doubly sure of retaining the filling than not quite sure enough. This must be regulated largely by the depth of the cavity. A shallow cavity will require more drilling into sound tissue for retention than a deep one.

In lower molars where the direction of the fissures results in the cavity being somewhat the shape of a cross, the corners of the enamel which approach the point where the fissures intersect should be broken down and the cavity changed to approach the form of a square with the sides facing the cusps.

The length of this paper prevents anything but a mere reference to buccal, lingual or labial cavities. The great difficulty in preparing these cavities if at all extensive is to control the gum which usually grows down into the cavity. The best means of overcoming this trouble is to place a large gutta-percha plug into the cavity and let it extend well over the cervicle border so as to press the gum back. If this is left in a week the gum will be forced away from the margin of the cavity without being wounded so as to prevent trouble from bleeding. Occasionally where there is no time to press the gum back with gutta-percha, it may be cut away with a lancet, but this usually causes quite extensive bleeding on account of the congested condition the gum is usually found in under these circumstances, and this interferes so materially with the work that it is always best to use the gutta-percha if possible. I should consider it preferable to try gutta-percha even if it were to be left in only one night.

As to the shape of the cavity, this must be governed entirely by the case in hand and little can be said save to gain retention at opposite sides of the cavity and in that portion of the tooth having the most sound tissue covering the pulp.

I have now considered somewhat hurriedly some of the most important points in the preparation of ordinary cavities. The subject is so broad that I have been obliged to avoid details in description as much as possible and I have dealt only with typical cavities.

We find in practice so many variations from the regular forms I have mentioned that it would be impossible in a

single paper to even refer to them in a general way. Many of the variations are worthy of detailed treatment in a paper by itself, and I submit for your consideration a subject so broad in extent, and so important in practice that I have found myself in something of a dilemma to determine what was most profitable for presentation.

MISTAKE OR MALPRACTICE, WHICH?

By A. E. BARKER, Idaho Springs, Col.

A young man, after vainly seeking me at the office one evening, called upon a physician, and pointed to the lower right second bicuspid as an aching tooth. This was at once extracted, and found to be perfectly sound. It was then concluded that the first bicuspid was the aching one, and it was promptly seized and broken short off at the margin of the gum. The physician sought me at home, sending the patient to my office, where we found him with his head between his hands, rocking to and fro in great pain. It was expected by both the physician and the patient that I would at once extract the root, but I relieved the pain with a mixture of cocaine and arsenic, which would also devitalize the pulp. The broken crown showed a small mesial cavity, in which a fruit-seed had been forced, and produced the pain from which relief had been sought. A careful examination failed to discover a single carious tooth in the otherwise perfect denture. The bicuspid which had meanwhile been kept in the patient's pocket, was washed, and after the usual preparation replaced in its carefully washed socket. On the first bicuspid root I subsequently placed a porcelain crown, and the patient has now a complete and comfortable denture.

The physician declares that in the future he will refer dental lesions to the dentist.

THE RESTORATION OF BROKEN INCISORS.

AMONG children and youths it not infrequently occurs that from falls or other accidents one or more of the incisors are broken off to a greater or less degree. In such cases the problem of effecting a suitable restoration to usefulness and sightliness is calculated to tax the resources of the most skillful dentist.

When, however, about half of a crown is absent and the pulp involved to a degree incompatible with its preservation, it has seemed to me desirable to retain the crown stump rather than to amputate it and place a porcelain crown on the roof. My own method of procedure is as follows: We will suppose the superior centrals to have been broken and the right central selected as a model for the description, which will equally apply to the other central or to any incisor under like circumstances.

Free access to the pulp-chamber is gained by cutting an oval-shaped opening. After thorough treatment and the subsequent filling of apical part of the canal, a countersink or access is cut in the end of the crown, preferably with an engine pin-centered fissure bur, followed by a wheel-bur cutting also on its end to form the rearward slot of the recess. A piece of thick gold or platinum plate is drilled, cut, and then fitted in the recess. A suitable post is then inserted through the plate, to which it is secured by wax, removed, and soldered. The end of the post is then cut off flush with the plate, and the piece replaced on the crown leaving the plate projecting from the recess. A short, thin cross-pin matching shade plate tooth is selected, ground to fit the smoothed natural crown end, and then backed with thin platinum, which is shaped and conformed to the lingual face of the crown. With the plate-punch and a small fissure-bur a slot is cut in the extension of the backing to allow the plate to project through it, replaced in the crown, secured with hard wax melted over it with a hot burnisher, removed, invested, and soldered so that the gold flows over the backing and its extension. This is then secured in the root and to the crown with cement, a thin film of which almost invisibly joins the porcelain tip to the crown and makes an impervious joining of the backing extension to the lingual face of the crown. The recessed plate and backing extension prevents

any turning of the structure, while the post secures it against displacement under the strains of incisive use.

Much of the preliminary work may be done from an accurate impression taken after the ends of the crown have been ground smooth and true, but the fitting, assembling, and soldering of the pieces should be done while the patient is present, in order to ensure the nicety of adaptation on which the permanent success of the operation will depend.

A somewhat extended and very satisfactory experience in this class of restoration affords a reasonable expectation that the method will also prove acceptable and useful to the profession.—DR. E. AMEND, *Cosmos*.

Dental News.

THE course of lectures on Operative Dental Surgery, at the National Dental Hospital, intended for practitioners as well as advanced students, will begin on Monday, October 12th, at 6.30 p.m., by a lecture on Amalgam, and a new Amalgam Equipment, by Mr. Amos Kirby.

The special subjects to be discussed by Mr. George Cunningham in this year's lectures will include :—

- (1) The Morphology of the Dental arches as affecting Methods of Treatment.
- (2) The practical application of bacteriological research in the treatment of the mouth and teeth.
- (3) Immediate root filling.
- (4) Restoration of extremely decayed teeth by matrix fillings with amalgams.
- (5) Open ferrule crowns.

Each lecture occupies about an hour and a half, every Monday till Christmas.

The fee for the course is £2 12 6.

ANSWER TO CORRESPONDENT.

C. M. — You would have to make special application to the Medical Council, but we should think the fact of the name being entered on the Students' Register in 1885, instead of on the Dental Register, would rather prejudice, than favour, your getting it on the latter now. You could at least try.

DENTAL STUDENTS' SUPPLEMENT. SEPTEMBER 15TH, 1891.

I.—THE LICENSING CORPORATIONS.

Comparative Summary of Regulations for the License in Dental Surgery.

	Royal College of Surgeons, England.	Royal College of Surgeons, Edinburgh.	Faculty of Physicians and Surgeons, Glasgow.	Royal College of Surgeons, Ireland.
1—PRELIMINARY EXAMINATION	Compulsory on all who commenced their Professional Education after July 22nd, 1878. Must be registered as a Dental Student at the office of the General Medical Council, 299, Oxford St., London, W.	Compulsory on all who commenced their Professional Education after July 22, 1878.	Compulsory on all who commenced the Professional Education after August 1st, 1878.	Compulsory on all, except those who have passed one equivalent examination.
2—Age at which the Candidate may present himself	Twenty-one.	Twenty-one.	Twenty-one	Any age, but diploma cannot be granted until he is twenty-one.
3—DURATION OF PROFESSIONAL EDUCATION.....	Four years subsequent to registration.	Four years.	Four years.	Four years.
4—COURSES OF LECTURES, &c., to be attended at a recognized School:—	One Course.	One Winter Course.	Two courses, or one Course and twenty Lectures on Head and Neck.	One Course.
Anatomy	One Course.	One Course of 50 Lectures, after 1st Oct. 1890, 1 course of 6 months.	One six months' Course.	One Course.
Physiology				

Royal College of Surgeons, England.	Royal College of Surgeons, Edinburgh.	Royal College of Surgeons, Ireland.	Faculty of Physicians and Surgeons, Glasgow.
<p>Surgery Medicine Chemistry Materia Medica Dissections and Demon- strations</p> <p>Practical Chemistry and Metallurgy Practice of Surgery, and Clinical Lectures..... Dental Anatomy and Phy- siology</p> <p>Dental Surgery & Patho- logy..... Dental Mechanics Metallurgy Practical Instruction in Mechanical Dentistry...</p> <p>Practice of Dental Surgery in a recognized Dental Hospital, or in the Dental Department of a recog- nised General Hospital 5—FEE</p> <p>6—LAST period during which unsuccessful Can- didates are referred to their studies</p>	<p>Ditto. Ditto. Instruction. Instruction. } Twelve months, 9 months; after Oct. 1st, 1890, 12 months. One Course of 20 Lectures. One three months' Course. One six months' Course. One Course. Ditto. Ditto. Three years under a Regis- tered Dental Practitioner</p> <p>Two years. £10 10s. over the above stamp duty. Six months, subject to the decision of the Board.</p>	<p>One six months' Course. Ditto. Ditto. One Three months' Course. Nine months. One Course. Three months. Three months. Six months of each. Twelve Lectures or Demon- strations. Twelve Lectures. Twelve Lectures. Twelve Lectures or Demon- strations. Three years under a Regis- tered Practitioner</p> <p>Two years. £10 10s. Six months.</p>	<p>One Course. None. One Course. Ditto. Two Courses. One Course. One Course. Two Winter Sessions. None. Two Courses, Three years under a Regis- tered Dental Licentiate.</p> <p>Nine months. £9 9s. Six months.</p>

(A) *Written.*

On General Anatomy and Physiology, General Pathology and Surgery, Dental Anatomy and Physiology, and Dental Pathology and Surgery.

(B) *Practical.*

(1) On the treatment of Dental Caries, and may be required to prepare and fill cavities with Gold or Plastic filling or material, or to do any other operation in Dental Surgery.

(Candidates must provide their own instruments).

(2) On the Mechanical and Surgical treatment of the various irregularities of Children's teeth.

(3) On Mechanical Dentistry,

(c) *Oral.*

Comprises the several subjects included in the curriculum of professional education, and is conducted by the use of preparations, casts, drawings, &c.

May and November.

8-DATE OF EXAMINATION

For further information apply to Secretary.

Written and Oral:

First Part-Anatomy, Physiology, Chemistry, and Metallurgy,

Second Part-Surgery, Medicine, Therapeutics, and Special Subjects, of Dental Anatomy and Physiology, Dental Surgery, Pathology, and Dental Mechanics, Registered Medical Practitioners are examined on these special subjects only.

Written, Orally Practical:

1st Part-Anatomy, Physiology, Chemistry, and Metallurgy,

Second Part-Surgery, Medicine, Materia Medica, and special Dental subjects.

Practical Examination at a Dental Hospital. Candidates are to bring Excavators, Files and Plugging Instruments

Written and Oral:

On all the subjects of the Curriculum.

Preparations, Microscopes, and other appliances.

1891 October 8-10
1892 May 5-7

JAS. ROBERTSON, Solicitor,
Clerk of College,
1, George Square, Edin.

ALEX. DUNCAN, Esq.,
Faculty of Physicians
and Surgeons,
Glasgow

Quarterly.
Candidates must be registered Dental Practitioners in practice before 1878.

G. F. BLAKE, Esq.,
Royal College of Surgeons, Dublin.

I. PRELIMINARY EXAMINATION.

REGULATIONS OF GENERAL MEDICAL COUNCIL.

No person shall be allowed to be registered as a Medical or Dental Student unless he shall have previously passed (at one or more Examinations) a preliminary Examination in the subjects of General Education as specified in the following List :—

1. English Language, including Grammar and Composition.
2. Latin, including Grammar, Translation from specified authors, and translation of easy passages not taken from such authors.
3. Elements of Mathematics, comprising (a) Arithmetic, including Vulgar and Decimal Fractions; (b) Algebra, including simple Equations; (c) Geometry, including the first Book of Euclid, with easy questions, on the subject matter of the same.
4. Elementary Mechanics of Solids and Fluids, comprising the Elements of Statics, Dynamics, and Hydrostatics.
5. One of the following Optional Subjects :—
(a) Greek; (b) French; (c) German; (d) Italian; (e) any other modern language; (f) Logic; (g) Botany; (h) Zoology; (i) Elementary Chemistry.

List of Examining Bodies whose Examinations fulfil the conditions of the Medical Council as regards Preliminary Education, and entitle to registration as Medical or Dental Student.

I. UNIVERSITIES IN THE UNITED KINGDOM.

UNIVERSITY OF OXFORD :—

1. Junior Local Examinations; Certificate to include Latin and Mathematics, and also one of the following optional subjects, Greek, French, German.
2. Senior Local Examinations: Certificate to include Latin and Mathematics.
3. Responsions.
4. Moderations
5. Examinations for a Degree in Arts.

UNIVERSITY OF CAMBRIDGE.

6. Junior Local Examinations; Certificates to include Latin and Mathematics, and also one of the following optional subjects:—Greek, French, German.
7. Senior Local Examinations; Certificate to include Latin and Mathematics.
8. Higher Local Examinations.
9. Previous Examination.
10. Examination for a Degree in Arts.

* * * In the case of Students in Universities with a prolonged curriculum, where the Examination in Mechanics required for their Degree is taken at a more advanced period of study than before commencing Medical Education, Registration can be effected only on having passed the Examination in Mechanics, but their registration may be then antedated to the period at which the Preliminary was passed.

UNIVERSITY OF DURHAM :—

11. Examination for Certificate of Proficiency.
12. Examination for Students at the end of their first year.
13. Examination for a Degree in Arts.

UNIVERSITY OF LONDON :—

14. Matriculation Examination.
15. Preliminary Scientific (M.B.) Examination.
16. Examination for a Degree in Arts or Science.

VICTORIA UNIVERSITY :—

17. Preliminary Examination ; Latin to be one of the subjects.
18. Entrance Examinations in Arts, to include all the subjects required.

UNIVERSITY OF EDINBURGH :—

19. Local Examinations (Junior Certificate) ; Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects :—Greek, French, German.
20. Local Examination (Senior Certificate) ; Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects :—Greek, French, German.
21. Preliminary Examination for graduation in Science or Medicine and Surgery.
22. Examination for a Degree in Arts.

UNIVERSITY OF ABERDEEN :—

23. Local Examinations (Junior Certificate) ; Certificate to include all the subjects required.
24. Local Examinations (Senior Certificate) ; Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects :—Greek, French, German.
25. Preliminary Examination for graduation in Medicine or Surgery.
26. Examination for a Degree in Arts.

UNIVERSITY OF GLASGOW :—

27. Local Examinations (Junior Certificate) ; Certificate to include all the subjects required.
28. Local Examinations (Senior Certificate) : Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following subjects :—Greek, French, German.
29. Preliminary Examination for graduation in Medicine or Surgery.
30. Examination for a Degree in Arts.

UNIVERSITY OF ST. ANDREWS :—

31. Local Examination (Senior Certificate) ; Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects :—Greek, French, German.
32. Local Examinations (Junior Certificate) ; to include all the subjects required.
33. Preliminary Examination for Graduation in Medicine or Surgery.
34. Examination for a Degree in Arts.

UNIVERSITY OF DUBLIN.

- 35. Public Entrance Examination.
- 36. General Examination at end of Senior Freshman year.
- 37. Examination for a Degree in Arts.

ROYAL UNIVERSITY OF IRELAND :—

- 38. Matriculation Examination.

OXFORD AND CAMBRIDGE SCHOOLS' EXAMINATION BOARD :—

- 39. Certificate, to include the following subjects, an adequate knowledge of English Grammar and Orthography, as shown in the course of the Examination, to the satisfaction of the Examiners, being held as conforming to the requirements of the Medical Council in regard to those subjects :
 - (a) Arithmetic, including Vulgar and Decimal Fractions ;
 - (b) Algebra, including Simple Equations ;
 - (c) Geometry, including the first two books of Euclid ;
 - (d) Latin, including Translation and Grammar ;
 - (e) Also one of these optional subjects, (Greek, French, German.)

II.—OTHER BODIES NAMED IN SCHEDULE (A) TO THE
“MEDICAL ACT.”

APOTHECARIES' SOCIETY OF LONDON :—

- 40. Examination of Arts.

* ROYAL COLLEGES OF PHYSICIANS AND SURGEONS OF EDINBURGH :—

- 41. Preliminary (combined) Examination in General Education.

* FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW :—

- 42. Preliminary Examination in General Education.

ROYAL COLLEGE OF SURGEONS IN IRELAND :—

- 43. Preliminary Examination ; Certificate to include Mathematics.

III.—EXAMINING BODIES IN THE UNITED KINGDOM NOT
INCLUDED IN SCHEDULE (A) TO THE “MEDICAL ACT” (1858).

COLLEGE OF PRECEPTORS :—

- 44. Examination for a First Class Certificate, or Second Class Certificate of First or Second Division, Algebra, Geometry, Latin, and either a Modern Language, or Greek, or Chemistry, or Botany, or Zoology, having been taken.
- 45. Preliminary Examination for Medical Students.

*QUEEN'S COLLEGE, BELFAST :—

- 46. Matriculation Examination.

*QUEEN'S COLLEGE, CORK :—

- 47. Matriculation Examination.

*QUEEN'S COLLEGE, GALWAY :—

- 48. Matriculation Examination.

INTERMEDIATE EDUCATION BOARD OF IRELAND :—

- | | | |
|------------------------------|---|---|
| 49. Junior Grade Examination | } | Certificate in each case to include
all the subjects required. |
| 50. Middle Grade Examination | | |
| 51. Senior Grade Examination | | |

*ST. DAVID'S COLLEGE, LAMPETER :—

52. Responsions Examination, to include all the subjects required.
EDUCATIONAL INSTITUTE OF SCOTLAND :—

53. Preliminary Medical Examination.

These Examinations are now conducted by the Educational Institute of Scotland, (No. 53).

*PHARMACEUTICAL SOCIETY OF GREAT BRITAIN :—

54. Preliminary and Minor Examination (*pro tanto*.)

*PHARMACEUTICAL SOCIETY OF IRELAND :—

55. Preliminary Examinations (*pro tanto*.)

SCOTCH EDUCATION DEPARTMENT :—

56. Leaving Certificates in each Grade and in Honours.

* The Examination of the Bodies to which an asterisk is prefixed, will not be accepted for purposes of Students' registration on and after January 1, 1892, except in cases in which a part of the Examination has been passed previous to that date.

IV.—CERTAIN EXAMINATIONS OF INDIAN, COLONIAL AND FOREIGN UNIVERSITIES AND COLLEGES.

REGISTRATION OF DENTAL STUDENTS.

Every Dental Student shall be registered in the manner hereinafter prescribed by the General Medical Council.

No Dental Student shall be registered until he has passed a Preliminary Examination, as required by the General Medical Council, and has produced evidence that he has commenced Dental Study.

The commencement of the course of Professional Study recognised by any of the Qualifying Bodies shall not be reckoned as dating earlier than fifteen days before the date of Registration.

Students who commenced their professional education by apprenticeship to Dentists entitled to be registered, or by attendance upon professional lectures before July 22nd, 1878 (when Dental Education became compulsory,) shall not be required to produce evidence of having passed a Preliminary Examination.

Candidates for a Diploma in Dental Surgery shall produce certificates of having been engaged during four years in Professional Studies, and of having received three years' instruction in Mechanical Dentistry from a registered Practitioner.

One year's *bona-fide* apprenticeship with a registered Dental Practitioner, after being registered as a Dental Student, may be counted as one of the four years of professional Study.

The three years of instruction in Mechanical Dentistry, or any part of them, may be taken by the Dental Student either before or after his registration as a Student; but no year of such Mechanical instruction shall be counted as one of the four years of Professional Study unless taken after registration.

III.—EDUCATIONAL BODIES.

LONDON.

DENTAL HOSPITAL OF LONDON, AND LONDON SCHOOL OF DENTAL SURGERY, LEICESTER SQUARE.

HOSPITAL STAFF.

Consulting Physician.—Sir J. RISDEN BENNETT, M.D., LL.D., F.R.S.

Consulting Surgeon—CHRISTOPHER HEATH, F.R.C.S.

Consulting Dental Surgeons.

SAMUEL CARTWRIGHT, F.R.C.S., L.D.S., Sir JOHN TOMES, F.R.S.
F.R.C.S., L.D.S.

Dental Surgeons.

- 9 a.m.—Monday ... C. E. TRUMAN, M.A., M.R.C.S., L.D.S.
 „ Tuesday ... R. H. WOODHOUSE, M.R.C.S., L.D.S.
 „ Wednesday GEORGE GREGSON, M.R.C.S., L.D.S.
 „ Thursday... STORER BENNETT, L.R.C.P., F.R.C.S., L.D.S.
 „ Friday ... CLAUDE ROGERS, M.R.C.S., L.D.S., D.M.D., Harvard.
 „ Saturday... F. CANTON, L.R.C.P., M.R.C.S., L.D.S.

Assistant Dental Surgeons.

- „ Monday ... LEONARD MATHESON, L.D.S.
 „ Tuesday ... W. HERN, M.R.C.S., L.D.S.
 „ Wednesday E. LLOYD WILLIAMS, L.R.C.P., M.R.C.S., L.D.S.
 „ Thursday... GEO. PARKINSON, M.R.C.S., L.D.S.
 „ Friday ... LAWRENCE READ, L.D.S.
 „ Saturday... W. PATERSON, F.R.C.S., L.D.S.

Administrators of Anæsthetics.

- 9.30 a.m.—Monday ... DUDLEY W. BUXTON, M.D., B.S., M.R.C.P.
 „ Tuesday ... FREDERICK HEWITT, M.D.
 „ Wednesday J. MILLS, M.R.C.S.
 „ Thursday F. WOODHOUSE BRAINE, F.R.C.S.
 „ Friday ... T. BIRD, M.A., M.R.C.S.
 „ Saturday... G. H. BAILEY, M.R.C.S.

AFTERNOON STAFF.

- 1.30 p.m.—Monday ... A. C. WOODHOUSE, L.D.S.
 „ Tuesday ... J. F. COLYER, M.R.C.S., L.R.C.P., L.D.S.
 „ Wednesday C. J. BENNETT, L.D.S.
 „ Thursday... W. H. WOODRUFF, L.D.S.
 „ Friday ... CHARLES F. RILOT, M.R.C.S., L.R.C.P., L.D.S.

Demonstrators.

E. BRIAULT, L.D.S.

A. COLYER, M.R.C.S., L.R.C.P., L.D.S.

W. H. DOLAMORE, L.D.S.

J. P. SMITH, M.R.C.S., L.R.C.S., L.D.S.

Medical Tutor—H. BALDWIN, M.R.C.S., L.D.S.

3 House Surgeons and 2 Assistant House Surgeons attend daily.

Demonstrations.—The Medical Officers will give Demonstrations on cases selected from time to time, every morning during the Lecture Season; and at the end of the Course those gentlemen who have attended the Demonstrations to the satisfaction of the Medical Officers will be permitted to perform operations at the Hospital under the supervision of the Medical Officers and the House Surgeon.

Dresserships for cases of Extraction.—The appointments are held for two months, and consist of six senior Dresserships for extractions under anæsthetics and eighteen Junior Dresserships for ordinary extractions.

The Senior Dressers will be selected from those pupils only who have entered fully both to the practice and lectures of this Hospital, and also to the Course required by the College of Surgeons for the Licence in Dental Surgery at one of the General Hospitals.

The Hospital is lighted throughout by electricity. The New Mechanical Laboratory is now open. The Laboratory is carefully filled with all the requirements of a modern Dental Laboratory, and is lighted with Electric Light for foggy weather. Each bench is also well lighted by first-rate daylight. The workroom is under the superintendence of A. J. WATTS, L.D.S.I., who will attend daily from 9 a.m. to 6 p.m. to give practical instructions to students.

MEDICAL SCHOOL.

The WINTER SESSION will commence on October 1st., 1891.

The SUMMER SESSION will commence in May, 1892.

LECTURES.

Dental Surgery and Pathology.—MR. STORER BENNETT.

Dental Anatomy and Physiology (Human and Comparative), by ARTHUR UNDERWOOD.

MEDICAL TUTOR.

The Medical Tutor attends four days in the week, from 5 to 7 p.m., for two months previous to two of the Annual Examinations. His classes are open to all Students, and are intended to assist those who are preparing for their examinations at the College of Surgeons; generally speaking, to guide and direct the studies of the pupils, and prepare them in the subjects for the Examinations.

FEES.

GENERAL FEE FOR THE SPECIAL LECTURES REQUIRED BY THE CURRICULUM.

Viz., two Courses on Dental Anatomy, two Courses on Dental Surgery, two Courses on Mechanical Dentistry, and one Course of Metallurgy, £15 15s.

Fee for the Two Years' Practice of the Hospital required by the Curriculum, £15 15s.

Total Fee for the Special Lectures and Hospital Practice required by the Curriculum, £31 10s.

Students who perform Operations for filling Teeth must provide their own Instruments for the same.

Additional Fees for a General Hospital for the two years, to fulfil the requirements of the Curriculum, vary from £40 to £60.

PRIZES.

The Prize-day will in future be held in July.

1. Prizes are awarded by the Lecturers for the best examinations in the subjects in their respective courses, at the end of the Summer and Winter Sessions.

2. Arrangements have been made for a Prize in Operative Dentistry, in the competition for which each candidate is entrusted with the care of a mouth, which he shall, if not impracticable, set thoroughly in order.

3. A prize of the value of five guineas is also given by Messrs. Ash & Sons for the best essay or a surgical subject connected with the mouth.

4. A scholarship of the value of £20 has been founded by Sir Edwin Saunders, and will be awarded at the close of each Summer Session.

Note.—The Medical Committee have resolved "that the holder of the Saunders Scholarship be admitted without additional fee to the extra year of Hospital Practice."

The Dean requests that all communications relating to the Medical School may be addressed to him at the Hospital, where he will attend in the afternoons, from Sept. 26th to Oct. 1st, inclusive, from 5 till 5.30 o'clock, or on Wednesday mornings from 10.30 till 12.

MORTON SMALE, M.R.C.S., L.D.S., L.S.A., *Dean*.

NATIONAL DENTAL HOSPITAL AND COLLEGE, GREAT PORTLAND STREET, W.

FOUNDED 1861.

HOSPITAL STAFF.

Consulting Physicians.

B. W. RICHARDSON, M.A., M.D., F.R.S.

W. H. BROADBENT, M.D., F.R.C.P.

Consulting Surgeons.

SIR SPENCER WELLS, BART., F.R.C.S. CHRISTOPHER HEATH, F.R.C.S.

Consulting Dental Surgeon.

SIR EDWIN SAUNDERS, F.R.C.S.

Hon. Visiting Physician.

E. W. ROUGHTON, F.R.C.S., &c.

Dental Surgeons.

Monday ... F. HENRI WEISS, L.D.S., Eng.

Tuesday ... ALFRED SMITH, L.D.S., Eng.

Wednesday ... G. A. WILLIAMS, L.D.S., Eng.

Thursday ... A. F. CANTON, L.D.S., Eng.

Friday ... H. G. READ, M.R.C.S. L.R.C.P., L.D.S.,
L.S.A., D.M.D., Harvard.

Saturday ... W. R. HUMBY, L.D.S., Eng.

Assistant Dental Surgeons.

Monday ... WILLOUGHBY WEISS, L.D.S., Eng.

Tuesday ... PERCY WHITE, M.B.B.S., M.R.C.S., L.D.S.,
Eng.

Wednesday ... MARCUS DAVIS, L.D.S., Eng.,

Thursday ... G. READ, L.D.S., Eng.

Friday ... C. W. GLASSINGTON, M.R.C.S., L.D.S., Edin.

Saturday ... W. RUSHTON, L.D.S., Eng.

House Surgeon.—M. WOOLF, L.D.S., Eng.

Anæsthetists.

PERCY EDGELOW, M.R.C.S., L.R.C.P.

JAMES MAUGHAN, M.D., L.R.C.P., M.R.C.S.

S. E. PEDLEY, M.R.C.S., L.R.C.P., L.D.S., Eng.

SIDNEY SPOKES, M.R.C.S., L.D.S., Edin.

EVERETT NORTON, M.R.C.S., L.S.A.

ARCHIBALD L. BRIGHT, M.R.C.S., L.R.C.P.

LECTURES.

Dental Anatomy and Physiology SIDNEY SPOKES, M.R.C.S., L.D.S. Edin.

Dental Surgery and Pathology WILLOUGHBY WEISS, L.D.S., Eng.

Dental Mechanics HARRY ROSE, L.D.S., Eng.

Dental Metallurgy W. LAPRAIK, F.I.C., F.C.S.

Operative Dental Surgery ... GEORGE CUNNINGHAM, B.A., D.M.D.,
L.D.S., Eng.

Dental Materia Medica C. W. GLASSINGTON, M.R.C.S. L.D.S., Ed.

Elements of Histology JAMES MAUGHAN, M.D., L.R.C.P.,

Demonstrator of Dental M.R.C.S.

Mechanics W. R. HUMBY, L.D.S., Eng.

The hospital is open for the reception of patients every week-day, from 9 o'clock till 11 o'clock a.m. The House Surgeon attends daily, from 9 a.m. till 2 o'clock p.m.

Dresserships in the Extraction Room.

These appointments are held for two months by six senior and twelve junior students of the Hospital. The respective dressers for each day are required to be in attendance from 9 o'clock till the conclusion of the practice; and they will be under the direction of the Dental Surgeons of the day, and of the House Surgeon.

The stopping rooms have accommodation for 20 chairs.

Clinical Lectures and Demonstrations.

Each medical officer will give clinical lectures, when opportune, during the ensuing year. Clinical lectures will also be given from time to time on cases of special interest; and also demonstrations upon the preparing and filling of cavities and other operations upon the teeth and contiguous parts.

The Hon. visiting Physician and Surgeon give Demonstrations weekly on cases of Oral Surgery, Anæsthetics, Cardiac, and Pulmonary lesions.

Attendance and Examination of Students.

A register is kept of the attendance of students at the Hospital practice and lectures. An attendance of full two years at Hospital practice is required by the College of Surgeons of England; and no schedule will be signed for any lectures of which less than two-thirds have been attended. Class examinations are held frequently during the several courses, to test the progress and attention of the pupils; and at the end of each course of lectures a written examination is held. An insufficient attendance at lectures disqualifies the student for receiving any prize of that year.

Tutorial classes are held to prepare for the final examinations, students who have, at this school, complied with the Dental portion of the Curriculum.

LECTURES.

WINTER SESSION, COMMENCING ON THURSDAY, Oct. 1st, 1891.

Dental Anatomy and Physiology, by Sidney Spokes, M.R.C.S., L.D.S., Edin. On Tuesdays and Thursdays, at 6 p.m., during October, November, and December.

Operative Dental Surgery, by George Cunningham, B.A., D.M.D., L.D.S., Eng. On Mondays, at 6.30 p.m., during October, November and December, (Free to Students of the Hospital and College.)

Dental Materia Medica and Therapeutics, by Charles W. Glassington, M.R.C.S., L.D.S., Edin. On Tuesdays, at 7.30 p.m. during October, November and December. (Free to students of the College.)

Dental Metallurgy, by W. Lapraik, F.I.C., F.C.S. On Tuesdays at 7.30 p.m., during January, February, and March.

Dental Mechanics, by Harry Rose, L.D.S. Eng. On Mondays at 7 p.m., during January, February, and March.

Demonstrations on Dental Mechanics, by W. Robinson Humby, L.D.S. Eng. On Wednesdays, at 7 p.m., during January, February, and March. (Free to students of the College.)

SUMMER SESSION, 1891.

Dental Surgery and Pathology, by Willoughby Weiss, L.D.S., Eng. On Mondays and Thursdays, at 6 p.m., during May, June, and July.

Elements of Histology, by James Maughan, M.D., L.R.C.P., M.R.C.S. On Mondays and Thursdays, at 5 p.m., during May, June, and July. (Free to students of the college.)

FEES.

GENERAL FEE FOR SPECIAL LECTURES REQUIRED BY THE CURRICULUM OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND: £12 12s.

Fees to single Courses.		One Course,		Two Courses.
Dental Anatomy and Physiology	...	£2 12 6	...	£4 4 0
Dental Surgery and Pathology	...	2 12 6	...	4 4 0
Dental Mechanics	... ..	2 12 6	...	4 4 0
Dental Metallurgy	... ..	3 3 0	...	5 5 0
*Operative Dental Surgery	... ..	2 12 6		
*Dental Materia Medica	... ..	2 2 0		
*Elements of Histology	... ..	1 1 0		
*Demonstrations on Dental Mechanics	... ..	1 1 0		

Hospital Practice to Registered Practitioners (six months), £7 7s. Ditto (twelve months), £9 9s.

Fee for the two years' Hospital Practice required by the Curriculum, £12 12s. Perpetual Fee, £15 15s.

Total Fee for the Special Lectures and Hospital Practice required by the Curriculum, £25 4s. Perpetual Fee, £31 10s.

PRIZES.

An Entrance Exhibition of the value of £15 will be awarded at the commencement of each Summer and Winter Session, after an Examination in the following Subjects:—

Elementary Physics (Statics, Dynamics and Electricity). Examiner—W. H. COFFIN, Memb. Phys. Doc. and Inst. Elect. Engineers.

Physiology. (The Functions of Respiration, Circulation and Digestion). Examiner—JAMES MAUGHAN, M.D.

Osteology. (Bones of the Head). Examiner—E. W. ROUGHTON, F.R.C.S.

Chemistry. Examiner—WM. LAPRAIK, F.I.C., F.C.S.

Dental Mechanics. (Theoretical and Practical). Examiners—HARRY ROSE, L.D.S. Eng., W. R. HUMBY, L.D.S., Eng.

Six Prizes in Medals, are open for competition among the students of the Colleges, at the end of each Course of Lectures, on the following subjects, viz.: Dental Anatomy, Dental Surgery, Dental Mechanics, Metallurgy, Operative Dental Surgery, and Dental Materia Medica.

Certificates of Honour will be awarded to those Students who show superior proficiency in any of the classes.

The Rymer Gold Medal for General Proficiency, value £5, will be awarded annually to the most distinguished Student of the year. His general conduct and attendance must have been in every respect satisfactory. At the time of the special examination for the Rymer Medal the Student must not hold any qualification. The Medal will be awarded on the understanding that the Student completes the Dental Curriculum.

The Ash Prize, value £3 3s. in cash for the best Thesis on a subject in Dental Surgery.

The public Distribution of Prizes will take place during the Winter Session.
F. HENRI WEISS, *Dean*.

EDINBURGH.

DENTAL HOSPITAL AND SCHOOLS.

Consulting Physician—ALEX. PEDDIE, M.D., F.R.C.P.E.*Consulting Surgeon*—JOSEPH BELL, M.D., F.R.C.S.E.*Consulting Dental Surgeon*—JOHN SMITH, M.D., F.R.C.S.E.*Dean*—W. BOWMAN MACLEOD, L.D.S.*Dental Surgeons.*

ANDREW WILSON, L.D.S., Edin.

MALCOLM MACGREGOR, L.D.S., Edin.

GEORGE W. WATSON, L.D.S., Edin.

J. STEWART DURWARD, L.D.S., Ed.

JAMES MACKINTOSH.

WILLIAM FORRESTER.

Assistant Dental Surgeons.

JOHN S. AMOORE, L.D.S., Eng.

J. GRAHAM MUNRO, L.D.S., Edin.

FRED. PAGE, L.D.S.

JOHN TURNER, L.D.S., Edin.

DAVID MUNROE, L.D.S., Edin.

THOMAS GREGORY, L.D.S.

Extra Assistant Dental Surgeons.

FREDERICK E. F. MASTERS, L.D.S.

SEWILL SIMMONS, L.D.S.

Chloroformists.

W. LUNDIE, M.B.C.M.

J. M. FARQUHARSON, M.B.C.M.

W. KEILLER, L.R.C.P. & S., Edin.

MATHESON CULLEN, M.D.

Tutorial Dental Surgeon.

HERBERT B. EZARD, L.D.S.

DENTAL SCHOOL.

LECTURES.

Dental Anatomy and Physiology (Human and Comparative) by ANDREW WILSON, L.D.S., (Edin.)—These Lectures will be delivered on the evenings of Tuesday and Friday, at 8 o'clock, commencing November, 1891. The course, consisting of twenty-four Lectures, will be illustrated by preparations, models, diagrams, microscopical specimens, etc.

Dental Surgery and Pathology, by GEORGE W. WATSON, L.D.S. (Edin.)—These Lectures will be delivered on the mornings of Tuesday and Friday at 8 o'clock, during the Summer Session, commencing May, 1892. The Course, consisting of twenty-two Lectures, will be illustrated by preparations, models, diagrams, microscopical preparations, etc.

Mechanical Dentistry, by W. BOWMAN MACLEOD, L.D.S. (Edin.)—The Lectures will commence November, 1891, at 8 p.m., and be continued every Wednesday thereafter till the Course of at least twelve Lectures is concluded.

Practical Mechanics.—Assistant Demonstrators, J. STEWART DURWARD, L.D.S. (Edin.), J. GRAHAM MUNROE, L.D.S. (Edin.)—In addition to the Systematic Lectures, there will be given during the Session, Demonstrations on Dental Mechanics, and each Student will be expected to prepare the mouth, take the impression, make the denture, and insert the same in at least four cases. Special facilities are afforded in the Mechanical Department; a large and fully equipped workroom under the charge and direction of a competent mechanic, having been set aside for the construction of dental appliances. The Demonstrations will be spread over the two years of Hospital practice, and will be given as occasion serves. Students will require to furnish their own hand tools.

In the various classes prizes will be offered for competition.

General Fee for the Hospital Practice and special Lectures required by the Curriculum.—Hospital Practice, £15 15s. One Course each of Dental Anatomy, Dental Surgery, and Mechanical Dentistry, £9 15s.—£25 10.

Fees to separate Classes.—Dental Anatomy, Dental Surgery, Mechanical Dentistry, £3 5s. each.

The Hospital Practice and Lectures qualify for the Dental Diploma of the Royal College of Surgeons, Edinburgh, and also for that of the other Licensing Bodies. Second Courses of the Lectures, as required by the Royal College of Surgeons of England, £2 4s.

For further information apply to the Dean, who will be found at the Hospital every Wednesday morning between 9 and 10 o'clock.

THE SESSION 1891-92 OPENS NOVEMBER 1ST, 1891.

General Fee for the Hospital Practice and special Lectures required by the Curriculum.

Hospital Practice, Two Years.....	£15	15	0
One Course of 24 Lectures in Dental Anatomy...	}	9	15
" 22 " " Surgery ...			
" 12 " " Mechanics }			
Total.....	£25	10	0

For further particulars, apply to the Dean, 5, Lauriston Lane, Edinburgh.

GLASGOW.

DENTAL HOSPITAL AND SCHOOL.

4. CHATHAM PLACE, STIRLING ROAD.

The Hospital is open daily except Saturday and Sunday. from 5 p.m. till 7 p.m.

The work of the Hospital is conducted as far as possible, by the Students, under the supervision of the Dental Officer of the day. Cases of special interest will be made the subject of clinical instruction or demonstration as they occur.

The practice of the Hospital may be entered upon at any time during the Session and attendance dated therefrom. Fee for the two years practice required by the Curriculum, £15 15s. Fee for each course of Lectures, £3 3s.

DENTAL SCHOOL.

Dental Anatomy and Physiology, Human and Comparative, by J. COWAN, WOODBURN, M.D.

The Lectures will be delivered in the Summer Session, on the mornings of Wednesday and Saturday at 8 a.m., and will be illustrated by Diagrams, Preparations, and Microscopic Specimens. Text Book—Tomes, Manual of Dental Anatomy, Human and Comparative.

Dental Surgery and Pathology, by REES PRICE, L.D.S. Eng., M.R.C.S.

These Lectures are delivered on Tuesdays and Thursdays during the months of May and June, at 8 a.m., and will be illustrated by recent Specimens, and other Preparations and Drawings, &c. Text-books—Tomes, Manual of Dental Surgery; Salter's Dental Pathology and Surgery.

Mechanical Dentistry, by J. A. BIGGS, L.D.S.

This course will commence on the first Tuesday of November at 7 p.m., and will consist of 12 Lectures, with Practical Demonstrations in Dental Laboratory.

All communications on matters relating to the Dental School should be addressed to the Secretary, 117 Wellington Street, Glasgow, who will forward detailed Prospectus of the School.

BIRMINGHAM.

BIRMINGHAM SCHOOL OF DENTISTRY, QUEEN'S COLLEGE.

The teaching of Dentistry is now undertaken by the Queen's College acting in association with the Birmingham Dental Hospital, and the Birmingham Clinical Board, so that students may fully qualify themselves for the Dental Diplomas of the Royal Colleges.

The Dental Hospital is situated near the College, and is open daily (Sunday excepted.) The number of patients treated there during the past year was upwards of 10,000.

The General and Queen's Hospitals offer every advantage for the study of General Surgery and Medicine, the arrangements for which are carried out under the direction of the Birmingham Clinical Board.

LECTURES FOR THE DENTAL CURRICULUM.

WINTER SESSION.

Special Subjects.

Dental Anatomy and Physiology.—J. HUMPHREYS, L.D.S.I., Dental Surgeon to the Dental Hospital. Thursday at 5 p.m.

Dental Surgery and Pathology.—C. SIMS, L.D.S. Eng., consulting Dental Surgeon, and Dental Surgeon to the Dental and Queen's Hospitals. Friday, at 5 p.m.

Dental Metallurgy.—W. A. TILDEN, D.Sc., F.R.S. N.B.—This class will be held at Mason's College. About ten lectures on this subject will be given on Tuesdays at 2.30 p.m., from October to Christmas.

General Subjects.

Anatomy, Practical Anatomy, Physiology, Chemistry, Medicine, Surgery. These Classes are similar to those in the Medical Department.

SUMMER SESSION.

Dental Tutor—W. J. MADIN, L.D.S. Eng.

Special Subjects.

Dental Mechanics.—W. ELLIOT, L.D.S., Edin. & Dublin, F.C.S. Wednesdays at 5 p.m.

General Subjects.

Materia Medica and Therapeutics.—*Practical Chemistry.*—These Classes are similar to those in the Medical Department.

FEES.

A Composition Fee of 60 guineas payable in one sum or in two sums, viz., 40 guineas at the beginning of the first year and 20 guineas at the beginning of the second year of studentship, admits to the full curriculum required for the Dental Diploma (inclusive of the necessary Hospital Practice).

N.B.—Further particulars may be obtained on application to the Warden at the College, or to the Hon. Secretary of the Dental Board, Queens' College. Mr. J. Humphreys.

BIRMINGHAM DENTAL HOSPITAL,

71, NEWHALL STREET.

OPEN DAILY AT NINE A.M.

Hon. Consulting Physician—ROBERT M. SIMON, M.D.*Hon. Consulting Surgeon*—JOHN ST. S. WILDERS, M.R.C.S.*Hon. Consulting Dentists :*

THOMAS R. ENGLISH.

ADAMS PARKER, L.D.S.

CHARLES SIMS, L.D.S.

Hon. Administrators of Anæsthetics :

S. HAYNES, M.B., Ch. M.

J. F. T. MORRISON, M.A., M.B.,

FELIX VINRACE, M.D., F.R.C.S.

F.R.C.S.

EDWARDS J. F. HALL, L.R.C.P. Edin.

E. G. HUTCHINSON, L.K., L.C.I.

Hon. Dental Surgeons :

H. BREWARD NEALE, L.D.S.

J. HUMPHREYS, L.D.S.

F. E. HUXLEY, M.R.C.S., L.D.S.

F. W. RICHARDS, L.D.S.

Hon. Assistant Dental Surgeons :

F. H. GOFFE, L.D.S.

A. E. DONAGON, L.D.S., M.A.

W. R. ROBERTS, L.D.S.

W. T. MARTIN, L.D.S.

F. R. HOWARD, L.D.S.

J. MOUNTFORD, L.D.S.

House Surgeon :

J. E. PARROTT, L.D.S.

DEMONSTRATIONS.

Clinical Demonstrations will be given from time to time by the staff on cases of particular interest ; also daily upon the preparing and filling of cavities, the insertion of porcelain inlays, pivoting teeth, adapting porcelain and metal crowns to broken down teeth.

Dresserships in the extraction room for all Students.

Dental Students are required to register their names for Hospital Practice with the Honorary Surgical Secretary, Mr. F. W. Richards, 27, Paradise Street, from whom further information may be obtained.

DENTAL HOSPITAL OF IRELAND.

25, LINCOLN PLACE, DUBLIN.

The WINTER SESSION will commence Monday, October 6th, 1890.

The SUMMER SESSION will commence in May, 1890.

Consulting Physicians.

F. R. CRUISE, M.D.

JOHN W. MOORE, M.D.

Consulting Surgeons.

E. H. BENNETT, F.R.C.S.I.

SIR W. STOKES, F.R.C.S.I.

Consulting Dental Surgeons.

R. H. MOORE, F.R.C.S.I.

DANIEL CORBETT, M.R.C.S.E.,
L.D.S., Eng.*Dental Surgeons.*

ROBERT HAZLETON, F.R.C.S.I.

DANIEL CORBETT, JUNR., A.B.,
F.R.C.S.I.

W. BOOTH PEARSALL, F.R.C.S.I.

R. THEODORE STACK, M.D., F.R.C.S.

GEORGE WYCLIFFE YEATES, M.B.,
Ch.M., L.D.S.I.

D.M.D. (Harv.) L.D.S., Eng. [I.]

A. W. W. BAKER, M.D., F.R.C.S.I.,
L.D.S.I.

G. M. P. MURRAY, F.R.C.S.I.

Assistant Dental Surgeons.

J. S. THOMSON, L.D.S., Ed.

| SHENSTONE BISHOP, L.D.S.I.

Anæsthetists.

CHRISTOPHER GUNN, M.D.

| JOHN G. CRONYN, L.R.C.S.I.,
| K.L.Q.C.P.I.JOHN R. GRAVES, L.R.C.S.I., L.K.Q.C.P.I.
Pathologist—WILLIAM MALLETT PURSER, M.D.
Registrar—WILLIAM A. SHEA.

In connection with the Dental Hospital of Ireland, the Dental School will be open for the Winter Session on October 6th, 1891.

All Dental Students who have passed their Preliminary Examination are admissible to the Clinical Instruction of the Hospital, after paying Fees and subscribing to the conditions prescribed by the staff.

In addition to Clinical Instruction, Courses of Lectures will be given at the Hospital in Dental Surgery and Pathology, and in Mechanical Dentistry, by R. Theodore Stack, M.D.; A. W. W. Baker, M.D.; W. Booth Pearsall, F.R.C.S.I.; and Daniel Corbett, F.R.C.S.I.; and at the School of Physic which is within a few yards of the Hospital. Special lectures for Dental Students will be given in Dental Anatomy, and in Metallurgy by Professor Cunningham, and Professor Reynolds.

The Lectures on Dental Surgery and Mechanical Dentistry will be given during the winter, those in Dental Anatomy and Metallurgy during the summer months.

In addition to the longer courses of Hospital attendance, special courses of three months duration, will be given to Surgeons about to join the Army and Navy, or to practice in the Colonies or remote country districts.

Regulations as to Fees and other conditions are the same that exist at the Dental Hospital of London, Leicester Square. Any further information can be obtained from the Registrar of the Hospital, or

R. THEODORE STACK, Dean.

THE OWENS COLLEGE, MANCHESTER.

DENTAL DEPARTMENT.

Anatomy—Professor ALFRED H. YOUNG, M.B., F.R.C.S.

Physiology—Brackenbury Professor WM. STIRLING, M.D., D.Sc.

Medicine—Professor J. E. MORGAN, M.A., M.D., F.R.C.P.,

Professor JAMES ROSS, M.D. L.D., F.R.C.P.

Surgery—Professor A. W. HARE, M.B., F.R.C.S.E., F.R.S.E.

Clinical Surgery—WALTER WHITEHEAD, F.R.C.S.E.

Chemistry—Professor HAROLD B. DIXON, M.A., F.R.S.

Organic Chemistry—C. SCHORLEMMER, LL.D., F.R.S.

Materia Medica—Professor D. J. LEECH, M.D., F.R.C.P.

Dental Surgery—G. G. CAMPION, L.D.S.

Dental Anatomy—W. A. HOOTON, L.D.S., L.R.C.P., M.R.C.P.

Dental Mechanics—THOMAS TANNER, L.D.S.

Dental Metallurgy—C. A. BURGHARDT, Ph.D.

Operative Dentistry—G. O. WHITTAKER, L.D.S.

The Fee for 2 years' lectures, &c., required by the Dental curriculum of the Colleges of Surgeons is £50 payable in two sums of £25 each at the beginning of the first and second years of studentship.

The 2 years' general Hospital practice is taken at the Royal Infirmary. The fee is £10 10 0, and includes that for attendance on the Lectures on Clinical Surgery.

For further particulars with regard to the Dental Department, application should be made to the Registrar, The Owen's College, Manchester.

THE VICTORIA DENTAL HOSPITAL OF MANCHESTER, GROSVENOR STREET, ALL SAINTS.

Consulting Physicians :

SIR WM. ROBERTS, M.D., F.R.C.P.	J. E. MORGAN, M.D., F.R.C.P.
HENRY SIMPSON, M.D., M.R.C.S.	D. J. LEECH, M.D., F.R.C.P.
D. LLOYD ROBERTS, M.D., F.R.C.P.	

Consulting Surgeons :

E. LUND, F.R.C.S.	W. WHITEHEAD, F.R.C.S.
F. A. HEATH, M.R.C.S.	T. JONES, F.R.C.S.
J. HARDIE, F.R.C.S.	

Consulting Dental Surgeons.

H. CAMPION, M.R.C.S.	PARSONS SHAW, D.D.S.
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Dental Surgeons,

Monday Morning	...	H. PLANCK, L.D.S.I.; I. RENSHAW, L.D.S.I.
Monday Evening		W. HEADRIDGE, L.D.S.I.; H. DRESCHFELD, L.D.S.I.
Tuesday Morning		T. TANNER, L.D.S., Eng.; G. O. WHITTAKER, L.D.S. Eng.
Wednesday Morning		P. A. LINNELL, L.D.S. Eng.; F. W. MINSHALL, L.D.S.I.
Wednesday Evening		W. A. HOOTON, L.D.S. Eng.; C. R. MORLEY, L.D.S. Eng.
Thursday Morning		W. DOUGAN, L.D.S.I.; E. P. COLLETT, L.D.S. Eng.
Friday Morning	...	G. G. GAMPION, L.D.S. Eng.; W. SIMMS, L.D.S.I.
Friday Evening		W. DYKES, L.D.S., Glas.; C. H. SMALE, L.D.S. Eng.
Saturday Morning		J. W. DUNKERLEY, D.D.S.I.; W. SMITHARD, L.D.S.I.

Administrators of Anæsthetics.

Wednesday Morning	...	...	...	J. PRINCE STALLARD, M.B.
Saturday Morning	...	...	...	ALEXANDER WILSON, M.R.C.S.

House Dental Surgeon.

W. RAWS BIRKETT, L.D.S., Eng.

The Hospital is situated conveniently for Students about 5 minutes' walk from The Owens College. It contains separate operating rooms devoted respectively to fillings, extractions, and operations under anæsthetics, and is open each morning in the week and on Monday, Wednesday and Friday Evenings.

A Laboratory has recently been opened to afford Students every facility for acquiring manipulative skill in Crown work and Mechanical Dentistry.

Through the generosity of Mr. Fletcher, of Warrington, prizes the value of £20 are competed for annually, and the prizes at the Owens College are also open to Students at the Hospital.

The Fee for the 2 years' Hospital Practice required by the College of Surgeons is £12 12s. For further information apply to

HENRY PLANCK, Dean,

LIVERPOOL. DENTAL HOSPITAL MOUNT PLEASANT.

Consulting Physician—THOMAS ROBINSON GLYNN, M.D., M.R.C.P., Lond.

Consulting Surgeon—FRANK T. PAUL, F.R.C.S., Eng.

Consulting Dental Surgeons.

C. ALDER, L.D.S.

H. C. QUINBY, L.D.S., D.D.S.

J. E. ROSE.

W. H. WAITE, L.D.S., D.D.S.

Honorary Dental Surgeons.

R. M. CAPON, L.D.S., Glasgow.

R. H. BATES, L.D.S., Eng.

E. A. COUNCELL, L.D.S., Eng.

R. EDWARDS, M.R.C.S., L.D.S., Eng.

H. NEWTON HINDLEY, L.D.S., Eng.

W. MAPPLEBECK, L.D.S.I.

THOS. MANSELL, L.D.S., Edin.

J.N.P. NEWTON, L.D.S., Eng., D.D.S.

W. J. PIDGEON, L.D.S., Eng.

M. QUINBY, D.D.S.

J. ROYSTON, L.D.S., Eng.

M. ALEXANDER, L.D.S.I.

Honorary Demonstrator of Operative Dental Surgery.

ARTHUR BLACK, L.D.S.

Honorary Anæsthetist.—J. G. GEMMELL, M.B., C.M.

Stipendiary Dental Surgeon.

J. P. ROBERTS, L.D.S., Edin.

Registrar—R. EDWARDS, M.R.C.S., L.D.S., Eng.

This Hospital is a school of Practical Dental Surgery, duly recognised by the Royal College of Surgeons, and open to all Students of Dentistry, under such regulations as shall be determined by the Committee of Management.

The Hospital is open, daily, for the admission of patients from 9 till 11 a.m. and from 6. 30 to 8 p.m., except on Saturday.

Fees for Hospital Practice. £12 12s. for two years' Hospital Practice required for the curriculum of Students of the Medical Faculty, University College, Liverpool, and Pupils or apprentices of Registered Dentists.

Further information may be obtained by applying to the Honorary Secretary, W. L. JACKSON, Central Buildings, North John Street.

PLYMOUTH. DENTAL HOSPITAL.

BANK STREET CHAMBERS, BANK STREET, PLYMOUTH.

The Dentists attend each day, at 9 a.m. except Sundays.

Certificates of attendance on the practice of this Dental Dispensary are recognized by the College of Surgeons as qualifying for the Diploma in Dental Surgery. The College also recognizes the lectures delivered at the Dispensary.

Pupils of any of the Dental Surgeons of the Plymouth Dental Hospital, or other Dentists holding a Diploma of the College of Surgeons, or Members of the Odontological Society, may attend the Hospital on the day of such practitioner as may agree to accept such pupils, on the payment of £1 1s. per annum to the institution.

A Course of Lectures will—if a sufficient number of Students present themselves—be delivered during the year.

On "Dental Physiology, Dental Anatomy, Dental Mechanics."

Fee to Lectures, one Course, £7 7s.

Fee to Lectures, double Course, £12 12s (required for Diploma.)

Fee to Dental Practice at Hospital £5 5s. per annum.

Fee to entire Dental Curriculum (required for Diploma) 22 guineas.

E. A. BENNETT, Hon. Sec. and Treasurer.

EXETER.

DENTAL HOSPITAL.

Consulting Surgeons.

A. J. CUMMING, F.R.C.S., Eng.

JAMES BANKART, M.B., Lond., F.R.C.S., Eng.

Consulting Dental Surgeon.

S. BEVAN FOX, L.D.S., Eng.

Dental Surgeons.

J. T. BROWNE-MASON, L.D.S., Eng.

HENRY BIGING MASON, L.D.S., Eng.

T. G. T. GARLAND, L.D.S.I.

J. M. ACKLAND, M.R.C.S., L.D.S., Eng.

S. MUNDELL, L.D.S., Eng.

JOHN W. SEVILLE, L.D.S., Eng.

Surgeon Administrators of Anæsthetists.

JOHN MORTIMER, M.B., Lond.

RUSSELL COOMBE, M.A., Cantab.
F.R.C.S., Eng.

Honorary Secretary.

GEORGE A. TOWNSEND.

Attendance on the practice of this Hospital is recognised by the Royal College of Surgeons of England as qualifying for their Dental Diploma.

The Hospital is open daily (Sundays excepted), and patients are admitted between the hours of 9 and 11 a.m.

Pupils or any member of the Staff or other registered Practitioner (being a Life or Annual Governor) are permitted to attend the Practice of the Hospital, subject to the approval of the Medical Sub-Committee, on payment of Five Guineas annually to the Funds of the Institution. Students attending the practice of the Hospital must consider themselves strictly under the control of the Medical Officers, and must not undertake any operation without the consent of the Dental Surgeon for the day.

Numbers of cases treated in 1890, 4867.

PRIVATE SCHOOL OF ANATOMY, PHYSIOLOGY AND SURGERY.

And all Professional Subjects.

Demonstrations and Lectures by Mr. Thomas Cooke, F.R.C.S., senior Assistant Surgeon to the Westminster Hospital; and other Masters.

By decision of the Royal Colleges of Physicians and Surgeons, gentlemen rejected at their Anatomical and Physiological Examinations (Primary R.C.S. or Second Conjoint) can get "signed up" from this School for the three or six months' work they are now required to put in before re-examination.

The school meets the requirements of two classes of students, namely:—

I. Students preparing for the usual Primary and Pass Examination of the several Licensing Bodies.

II. Qualified Practitioners and advanced Students, *i.e.* gentlemen wishing either to obtain some of the Higher Qualifications, or to compete for Appointments in Her Majesty's Army, Navy, and Indian Medical Services. For these, special Classes are provided.

IV.—GENERAL HOSPITALS.

CHARING CROSS HOSPITAL.

Dental Surgeon—J. FAIRBANK, M.R.C.S., *Assistant Dental Surgeon*—J. F. COLYER, M.R.C.S., L.R.C.P., L.D.S., who attend at the Hospital, three days a week, at 9 a.m., for Dental Operations. A course of Lectures on Dental Surgery is also given during January, February, and March, by Mr. FAIRBANK, and Tutorial classes three days each week throughout the year by Mr. COLYER.

Two prizes are awarded annually in the class of Lectures on Dental Surgery, of the value of six guineas and four guineas respectively. Dental Students can also compete for the Golding scholarship of £15.

Students may serve as assistants to the Dental Surgeon for a period of three months.

The composition fee for dental students is 54 guineas, or 60 guineas, payable in two instalments of 50 guineas each.

A reduction will be made in the case of students who produce certificates on joining the school of previous attendance on chemistry, practical chemistry, and *materia medica*, and an additional reduction will be made to dental students not at present requiring practical physiology.

The hours of lectures have been specially arranged to suit the convenience of dental students. Charing-cross Hospital is within three minutes walk of the Dental Hospital of London.

For further information apply to the Dean, Mr. Stanley Boyd, or to the Librarian and Secretary, Mr. Francis Pink, at the office of the Medical School, Chandos Street, Charing-cross, between the hours of 10 and 4.

LONDON HOSPITAL AND MEDICAL COLLEGE.

Dental Surgeon—ASHLEY BARRETT, M.B., Lond., M.R.C.S., L.D.S.

The Council of the College of Surgeons recognize the Dental Department of the London Hospital as a school at which may be obtained the Dental Practice necessary to qualify a student for the Examination of the Dental Diploma. Dental Students may obtain the General Medical Education (that is, apart from certain special Lectures to be attended at a Dental School) and the Dental Practice necessary for the Diploma, at the London Hospital School, on payment of Forty Guineas.

A course of Lectures on the Anatomy and Pathology of the Teeth and Dental Surgery will be delivered by Mr. Ashley Barrett, on days which will be duly announced. It comprises the treatment of Dental irregularities, of Dental Caries and such matters in connection with the subject as are of interest to the Medical Practitioner. Mr. Barrett gives practical instruction on Tuesdays at 9 a.m., which is open to all students of the School and can be attended by gentlemen who are not pupils on payment of a fee of Ten Guineas.

In addition to the Lectures a series of Demonstrations of the simpler modes of filling teeth will be given during the month of June. The Demonstrations will refer to the modes of Manipulating Amalgam and Gutta Percha fillings, the preparation of Cavities, the filling of Teeth containing vital and dead pulps, the mode of relieving pain after filling, and the instruments needed for these operations.

A *Dental Assistant* is elected every three months, without any additional expense. The terms of the office date from the first Tuesday in January, April, July and October. In selecting Candidates, priority will be given to those who have attended the greatest number of Lectures on Dental Pathology and Surgery, and have also been the most punctual in attendance in the Dental Department on Tuesday morning.

Further information may be obtained on application to Mr. Munro Scott, the Warden, Medical College, London Hospital.

KING'S COLLEGE, STRAND, W C.

Special arrangements are made for Dental Students. Apply to the Dean.

MIDDLESEX HOSPITAL.

Consulting Dental Surgeons—SIR J. TOMES, F.R.S., F.R.C.S., L.D.S.
J. S. TURNER, M.R.C.S., L.D.S.

Dental Surgeon—W. STORER BENNETT, F.R.C.S., L.R.C.P., L.D.S.

Assistant Dental Surgeon—W. HIERN, M.R.C.S., L.D.S.

In 1887 the acquisition of a site in Cleveland Street enabled a much needed extension of the Buildings to be carried out. The additions included an additional Lecture Theatre, a physiological Laboratory and Class Room, a Student's Room, and a Luncheon Room. A new and commodious Library and a Materia Medica Museum have also been opened.

Students who intend to become Licentiates in Dental Surgery of the Royal College of Surgeons are admitted to attend the requisite courses of Lectures—which are arranged to fit in with the work at the Dental Hospitals—and Hospital Practice on payment of a fee of 54 guineas, in one payment, or by instalments of £42 on entrance, and £21 at the beginning of the Second Winter Session.

A short course of Lectures on Dental Surgery will be delivered during November and December by the Lecturer on Dental Surgery, Mr. Storer Bennett. The Lectures will be supplemented by practical Demonstrations, which will be given every week during the Winter and Summer Sessions by the Dental Surgeon and Assistant Dental Surgeon. Students of the Hospital free, others pay a fee of 2 guineas.

Further information may be obtained from A. Pearce Gould, F.R.C.S., the Dean, or from the Resident Medical Officer at the Hospital.

ST. GEORGE'S HOSPITAL.

Dental Surgeon—H. L. ALBERT, M.R.C.S.

Mr. Albert attends at the Hospital on Mondays and Fridays at 1 p.m.; his assistant on Tuesdays and Saturdays, and at 1 p.m.

A course of Lectures on Dental Surgery is given by Mr. Albert in the Summer Session. Free to Students of the hospital.

Fee for general subjects in Dental Surgery, exclusive of Practical Chemistry, £55. Payable in two instalments; first year, £30; second year, £25.

Further information can be obtained by application to Dr. WHIPHAM, Dean of the Medical School.

ST. BARTHOLOMEW'S HOSPITAL AND COLLEGE.

Dental Surgeons—MR. PATERSON, MR. ACKERY.*Assistant Dental Surgeon*—MR. READ.

The Dental Department of the Hospital is open on Tuesday and Friday mornings at 9 o'clock. The practice of the department is recognised by the Royal College of Surgeons.

The fee for general subjects for Dental Students for the first winter is £33 2s. 6d., for the first summer £33 2s. 6d., or a single payment of £66 3s.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.

Dental Surgeon—MORTON SMALE, M.R.C.S., L.D.S.

Practical instruction in Dental Operations is given on Wednesdays and Saturdays at 9 a.m. Dressers are appointed who hold office for three months.

For prospectus and further information apply to the School Secretary.

GEORGE F. FIELD, Dean of the School.

ST. THOMAS'S HOSPITAL.

Dental Surgeon—CHARLES EDWIN TRUMAN, M.D.C.S., L.D.S.*Assistant Dental Surgeon*—

Gentlemen may receive instruction in diseases of the teeth, are appointed dressers, and can undertake operations, subject to the supervision of the Dental Surgeons, Tuesdays and Fridays at 10 a.m.

Numerous cases of irregularity of the teeth, and the application of artificial appliances, are undertaken during the term.

The fee for attendance on the *general* subjects required of the students in Dental Surgery, is, for the two years, £55 or by instalments, £50 for the first year, and £10 for the second year.

Dental practice, one year, two guineas; perpetual, three guineas.

WESTMINSTER HOSPITAL.

Dental Surgeon—J. WALKER, M.D., M.R.C.S., L.D.S.

Dr. Walker attends at 9.15 a.m. on Wednesdays, and on Saturdays at 9.15 a.m., for practical demonstration of diseases and operations on the teeth.

The fee for attendance on the Dental Practice is £2 2s. for three months, and £3 3s., for six months. The whole of the General Lectures and Surgical Practice required for the Dental Diploma of the College of Surgeons can be attended for £48 in one sum on entrance, or for two sums of £30, and £20 payable at the beginning of each year.

Dr. Walker will deliver a course of Lectures on Dental Surgery and Pathology at an hour to be determined at the commencement of the Session.

A scholarship value £20 is offered annually in September for Competition to commencing Dental Students.

SCHOOL OF MEDICINE, SURGEON'S HALL, EDINBURGH.

The fees required for students attending general subjects necessary for the curriculum of the Royal College of Surgeons. Edinburgh, are the same as those for the Conjoint Examining Board, as Candidates for the L.R.C.S.E. require to be in possession of a recognised Diploma in Medicine.

GUYS HOSPITAL.

A Dental School has recently been added to the Hospital which is professed to be a complete Institution.

Dental Surgeon.—F. NEWLAND-PEDLEY, F.R.C.S., L.D.S.E.

Assistant Dental Surgeon.—W. A. MAGGS, L.R.C.P., M.R.C.S., L.D.S.E.

FEES.

A Ticket which gives admission to the General and Special Lectures and Demonstrations, and to the Hospital and Dental Practice, may be obtained :—

1. By the payment of £70 on entrance.
2. By two payments of 40 guineas, and 30 guineas at the beginning of the First and Second Years respectively.

A Ticket which gives admission to the Special Lectures and Demonstrations and Dental Practice only may be obtained for 30 guineas paid on entrance.

HARVARD UNIVERSITY DENTAL DEPARTMENT BOSTON, MASS, U.S.A.

The Sessions of this School begin the last Thursday in September, and end the last Wednesday in June, making nine months of practically continuous work in each year.

General Anatomy, with Dissections, Physiology, and General Chemistry, are the studies of the first year. Of the second year they are Operative and Mechanical Dentistry, Dental Materia Medica and Therapeutics, Oral Surgery, and Surgical Pathology. The Student can also attend gratuitously all the lectures in any other department in the University.

The Infirmary furnishes abundant facilities, averaging 8,000 operations, of which a large proportion consists of filling teeth, every year.

The University degree D.M.D. (Dentariæ Medicinæ Doctor) is conferred on all who fulfil the requirements.

The diploma is recognized by the English Medical Council, except for British Subjects.

For the first year a student is a member of the school the fee is 200 dols ; for the second year, 150 dols . and for any subsequent year, 50 dols.

For further information and catalogues, address, Thomas H. Chandler, Dean, 161, Newbury Street, Back Bay, Boston, Mass U.S.A.

THE DENTAL COLLEGE OF THE UNIVERSITY OF MICHIGAN.

The Seventeenth Annual Session of this Institution will commence on the 1st of October, and close on the last Wednesday of June, thus making a course of nine months. A preliminary examination, having reference to general education attainments, is required.

The Student in this department will receive instructions in Anatomy Physiology, Pathology, Chemistry, Materia Medica, Therapeutics, Surgery and Hygiene, from the professors of their respective branches in the *Departments of Medicine and Surgery* of the University, when lectures commence and continue the same as with the Dental College.

FACULTY OF THE DENTAL DEPARTMENT.

President.

JAMES B. ANGELL, LL:D.

Dean.

JONATHAN TAFT, M.D., D.D.S.

Professor of Oral Pathology and Surgery.

Special instructions will be given in Dental Pathology, Oral Surgery, Dental Therapeutics, and diseases of Women and Children, with reference to the teeth.

FEES AND EXPENSES.

The fees, which must be paid in advance, are as follows:—

RESIDENTS OF MICHIGAN.—Matriculation, 10.00 dols. Annual dues, 25.000 dols.

NON-RESIDENTS. Matriculation, 25.00 dols. Annual dues, 35.00 dols.

For the various Laboratories, 35 dols.

GRADUATION FEE.—For all alike, 10.00 dols. The admission fee is paid but once, and entitles the student to the privilege of permanent membership in any department of the University. The Annual due is paid the first year and every year thereafter while at the University.

IV.—SCIENTIFIC ASSOCIATIONS.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN, 40, LEICESTER SQUARE.

OFFICERS FOR 1890.

President—S. J. HUTCHINSON.

Vice-Presidents.

RESIDENT.
J. STOCKEN.
DAVID HEPBURN.
T. H. G. HARDING.

NON-RESIDENT.
W. L. MACLEOD, (Edinburgh).
J. H. REDMAN, (Brighton).
R. T. STACK.

Treasurer—THOMAS ARNOLD ROGERS.

Librarian—ASHLEY GIBBINGS.

Curator—STORER BENNETT.

Editor of the Transactions—WALTER COFFIN.

Honorary Secretaries.

J. ACKERY (Council)

W. A. MAGGS. (Society)

F. H. WEISS (For Foreign Correspondence).

Councillors.

RESIDENT.

C. S. TOMES, F.R.S.
WILLOUGHBY WEISS.
W. H. WOODRUFF.
W. HERN.
F. NEWLAND-PEDLEY.
C. J. BOYD WALLIS.
F. J. BENNETT.
CORNELIUS ROBBINS.
E. G. BETTS.

NON-RESIDENT.

M. de C. DICKENSON (St Leonards-on-Sea).
A. A. de LESSERT, (Aberdeen).
ALEX. FOTHERGILL (Darlington).
W. B. BACON (Tunbridge Wells).
H. B. MASON (Exeter).
MORDAUNT A. de C. B. STEVENS (Paris).
T. S. CARTER (Leeds).
E. BINNS (Middlesboro').
W. S. WOODBURN (Glasgow).

EXTRACTS FROM THE BYE-LAWS.

Objects and Constitution of the Society.

« The Society is instituted for the encouragement and diffusion of knowledge in Dental Surgery, and for the promotion of intercourse among Members of the Dental Profession.

The Society shall consist of Resident, Non-Resident, Corresponding, and Honorary Members.*

1. The Resident Members shall consist of gentlemen residing or practising wholly or partly in London or within ten miles of General Post Office, St. Martin's-le-Grand.
2. The Non-Resident Members shall consist of gentlemen wholly practising beyond ten miles from the General Post Office.
3. The Corresponding Members shall consist of distinguished gentlemen residing in the Colonies of Great Britain or Foreign Countries.
4. The Honorary Members shall consist of distinguished Practitioners of Dental Surgery who have retired from practice, of distinguished Medical practitioners, and of gentlemen distinguished in any department of science.

Persons who advertise in the public journals, or by circular, either their profession or their professional attainments or public appointments, or anything relating to their mode of practice or charges, or who expose for public inspection specimens of operative or mechanical Dentistry, or conduct their practice in any way which in the opinion of the Council of this Society, is derogatory to the respectability of the Profession, shall not be considered eligible for nomination as members.

No person being the proprietor of a secret remedy, or holding a patent relating to the requirements of Dental Practice, shall be a member of this Society.

Election and Admission of Resident and Non-Resident Members.

Candidates for Resident Membership shall be recommended by four or more Members, two at least signing from personal knowledge. Candidates for Non-Resident Membership shall be recommended by three members, one at least signing from personal knowledge.

All recommendations for resident or non-resident members shall be submitted to, and approved of, by the Council, before being proposed to the Society for ballot.

* Candidates for the Resident, Non-Resident, or Corresponding Membership of the Society shall not be eligible unless they practice as Dental Surgeons, or are interested in the progress of Dental Surgery, and are also Licentiates in Dental Surgery, or qualified Practitioners of Medicine or Surgery; or possess such a Diploma or Degree as in the opinion of the Council, will qualify them for the Membership of the Society.

Contributions of Members.

Every person elected a Resident Member shall pay Three Guineas as an Admission Fee and an Annual Subscription of Two Guineas, *in advance*.

Every person elected a Non-Resident Member shall pay Two Guineas as an Admission Fee and an Annual Subscription of One Guinea in advance.

The Entrance Fees and first Annual Subscriptions shall be paid on admission, and the subsequent Annual Subscriptions in the month of November in each year; but new members proposed at or after the Annual Meeting, shall not be required to pay any Subscription for the current Session.

Ordinary Meetings.

The Ordinary Meetings of the Society shall be held on the first Monday in each month, from November to June, both inclusive, at 8 p.m. precisely, except in the month of January, or when an Act of Parliament holiday occurs on that day, the Meeting shall be held on the Monday next ensuing.

Each Member may introduce two Visitors at these Meetings on writing the Visitor's names in a book to be kept for that purpose. The same Visitors will not be admitted more than three times during one Session.

Annual General Meeting.

The Annual General Meeting of the Society for the election of the Officers and Councillors, &c., shall be held on the evening of the second Monday in January every year.

Society's Transactions.

The Transactions of the Society, under the designation of "Transactions of the Odontological Society of Great Britain," shall be printed at such times and in such manner as the Council shall direct.

The "Transactions" shall be presented to all Resident and Non-Resident members of the Society who have paid their Annual Subscriptions.

ODONTO-CHIRURGICAL SOCIETY OF SCOTLAND

5, LAURISTON LANE, EDINBURGH.

President—G. W. WATSON, L.D.S.

Vice-Presidents.

J. STEWART DURWARD, L.D.S. | JOHN STIRLING, L.D.S.

Treasurer—JAMES MACKINTOSH, Esq.

Secretary—JOHN S. AMOORE, L.D.S., Eng., 7, Abercromby Place.

Curator and Librarian—J. GRAHAM MUNRO, L.D.S.

REES PRICE, L.D.S., Eng.

ANDREW WILSON, L.D.S.

J. AUSTIN BIGGS, L.D.S.

W. NORMAN MACLEOD, L.D.S.

Ordinary Meetings.—The Society meets on the second Thursdays of November, December, January, February and March.

EXTRACTS FROM THE CONSTITUTION AND LAWS.

Name and Objects.

The Society shall be named the "Odonto-Chirurgical Society," and shall have for its objects the Promotion and Diffusion of Knowledge in matters connected with Dental Surgery; the furtherance of communications on such subjects by Members of the Society; and otherwise to advance the interests of Dental Surgery as a branch of Medicine.

Ordinary and Honorary Members.

The Society shall consist of Ordinary, Honorary, and Corresponding Members.

The Ordinary Members shall consist of Gentlemen practising as Dentists in Great Britain, and of Medical and Surgical Practitioners interested in Dental Surgery.

The Honorary and Corresponding Members shall consist of Gentlemen practising Dentistry in Great Britain, in the Colonies, or in Foreign Countries, and of retired Dental Practitioners in Britain, as well as such Medical or generally Scientific men as may have distinguished themselves in connection with Dental Surgery.

The Ordinary Members shall have vested in them the Government of the Society, and all cases not otherwise specified shall be decided by them by a majority of votes by ballot, if required.

Obligations of Members.

No Member shall be permitted to advertise his profession, his modes of practice, or his charges, either in the public journals or by circular. They shall not be permitted to expose specimens of their work for public inspection, nor to carry on their practice in connection with any other business, nor to hold any patent relating to Dental practice, nor to conduct themselves in any way which the Society may consider derogatory to the Profession, so long as they continue members of the Society. But members who practise in towns other than that in which they reside shall be allowed to intimate their visits: such intimations being subject to the approval of the Council.

Applications for Membership.

Candidates for admission as Members of the Society shall be recommended by an Ordinary Member, and the recommendation seconded by another. After being approved by the Council, such recommendation shall be read to the Society at an Ordinary Meeting, and shall lie over to the next, when the Candidate shall be balloted for, when two-thirds of the Members present must be in his favour to secure his election.

Contributions.

Ordinary Members residing within a ten-mile radius of the City shall pay an Entrance Fee of One Guinea, and One Guinea of an Annual Subscription in advance. All other Ordinary Members shall pay an Entrance Fee of One Guinea, and Ten Shillings and Sixpence of an Annual Subscription. All Annual Subscriptions to date from the 1st March preceding the Candidate's admission.

THE BRITISH DENTAL ASSOCIATION.

(Incorporated June 3rd, 1880.)

40, LEICESTER SQUARE, LONDON.

President—J. SMITH TURNER, M.R.C.S., L.D.S. Eng.*President-Elect*—H. C. QUINBY, L.D.S.I.*Vice-Presidents.*

SIR EDWIN SAUNDERS, F.R.C.S.	|	SIR JOHN TOMES, F.R.S., F.R.C.S.,
DR. JOHN SMITH, F.R.C.S., Edin.	|	L.D.S., Eng.

Treasurer—W. H. WOODRUFF, L.D.S., Eng.*Secretary*—W. B. PATERSON, F.R.C.S., L.D.S., Eng.*Extracts from Memorandum of Association and Bye-laws.*

The objects for which the Association is established are the promotion of Dental and the allied Sciences, and the maintenance of the honour and the interests of the Dental Profession by

“The Periodical meetings of the Members of the Association and the Dental profession generally, in different parts of the country.

“The publication of a periodical journal, and by

“The maintenance of the spirit and provisions of the Dentists’ Act, by such lawful means as may be necessary, &c., &c.”

Extracts from the Bye-laws.

A person who is registered in the Dentists’ Register shall be eligible for election as a member of the Association, provided that he be of good character; that he does not conduct his practice by means of the exhibition of Dental specimens, appliances, or apparatus in an open shop, or in a window, or in a showcase exposed to public inspection; or by means of public advertisements or circulars, describing modes of practice, or patented or secret processes; or by the publication of his scale of professional charges.

Any registered practitioner not disqualified by any Bye-law who shall be recommended as eligible by any three Members of the Association (the recommendation of one being from personal knowledge), and who has signed the appended form of application for admission and agreement as to terms of Membership, may be elected a Member by the Representative Board or by the Council of a recognized Branch.

The subscription is one guinea per annum, and each member is entitled to a copy of the Journal of the Association monthly, and to attend the Annual Meetings of the Association.

STUDENTS' SOCIETY OF THE DENTAL HOSPITAL OF LONDON, LEICESTER SQUARE, W.C.

The object of the Society is the consideration of matters specially appertaining to Dentistry. The affairs of the Society are managed by a Council consisting of a President, two Vice-Presidents, Treasurer, two Secretaries, Curator, and nine other members. The President is chosen from the past Students who have obtained their degree of L.D.S.; the Vice-Presidents from past Students with or without qualification.

Any gentleman wishing to become a member, must be proposed and seconded at one meeting, and be balloted for the next; one black ball in four to exclude. The entrance fee for ordinary members is half-a-crown, and there is an annual subscription of the same amount.

Ordinary meetings are held at 8 p.m. on the second Monday in every month, from October to March inclusive. The annual meetings for the election of officers and other business is held on the third Monday in January in each year.

Every member has the power of introducing one visitor, not being a Student of the Hospital or School, to the meetings, with the consent of the President. Visitors are invited to take part in the discussion of the papers and clinical cases.

There is a Library and a Museum in connection with the Society, both being under the superintendence of the Curator.

The Council offer a prize, value £3 3s., at the end of each year, for the best paper read before the Society during that year.

THE MIDLAND BRANCH OF THE BRITISH DENTAL ASSOCIATION.

EXTRACT FROM BYE-LAWS.

Composed of Members of the British Dental Association who reside in the Midland and North Western Counties of England, and of Associates who can fulfil the conditions laid down in the Bye-laws. The Annual Meeting takes place in May.

2. The Association shall consist of Members and Associates. No one shall be eligible for membership who is not already a member of the British Dental Association. Any registered Practitioner of good character, who does not conduct his practice by means of the exhibition of Dental specimens, appliances or apparatus in an open shop, or in a window, or in a showcase exposed to public inspection: or by means of public advertisements or circulars describing modes of practice; or patented or secret processes; or by the publication of his professional charges, may be admitted as an Associate. Associates shall be entitled to all the privileges of the Branch Association, but shall not be entitled to vote or hold office therein

3. Any member of the British Dental Association may be elected a Member of the Branch by the Council of the Branch, at any of their ordinary Meetings, on his sending a written application for election to the Secretary of the Branch.

4.th Any registered Practitioner who can subscribe to the conditions laid down in Bye-law 2, and who shall be recommended as eligible by any three Members or Associates, may be elected an Associate by the Council, on his forwarding the recommendation and his subscription to the Honorary Secretary of the Branch.

BRITISH DENTAL ASSOCIATION, WESTERN BRANCH.

A person who is registered in the Dentists, Register shall be eligible for election as a Member of this Branch, provided he be of good character; that he does not conduct his practice by means of the exhibition of Dental specimens, appliances, or apparatus in an open shop, or in a window, or in a show case exposed to public inspection; or by means of public advertisements; or circulars describing modes of practice, or patented or secret processes: or by the publication of his scale of professional charges.

Any dental practitioner who can subscribe to the conditions laid down in Bye-law 4, who has been recommended as eligible by any three members of this Branch, may be elected a Member by the Council, and shall be admitted a Member of the British Dental Association.

BRITISH DENTAL ASSOCIATION. EASTERN COUNTIES BRANCH.

Districts.

Norfolk, Suffolk, Cambridgeshire, Essex, Lincolnshire, Northamptonshire, Bedfordshire, Hertfordshire, and Bucks.

Bye Law.

Any Registered Dental Practitioner, who shall be recommended as eligible by any three members of the Branch, (one being from personal knowledge,) may be elected a member by the Council. The election to be by ballot; three black balls to exclude.

STUDENT'S SOCIETY OF THE NATIONAL DENTAL HOSPITAL AND COLLEGE.

This Society, which was established March 16, 1878, was constituted for the encouragement and diffusion of knowledge in Dental Science, and for the promotion of intercourse among its Members: and all Students of Dental Science are eligible for Membership. All candidates for Membership must be approved by the Council before being proposed to the Society for election. The Entrance Fee is 2s 6d. to be paid in advance. The Ordinary Meetings of the Society are held on the first Friday in each month, from October to June, both inclusive at 8 p.m. precisely. Each Member may introduce two visitors, not being Students of the Hospital or College, but the same visitors may not be admitted more than three times during one Session.

STUDENTS SOCIETY OF THE DENTAL HOSPITAL OF LIVERPOOL.

This Society is constituted for the consideration of matters generally and specially appertaining to Dental Surgery.

Candidates for membership must be approved by the Council before being proposed to the Society for election. Such proposals are posted during one meeting of the Society, and remain so posted until the next monthly meeting when the candidate is balloted for. No candidate is elected unless he have the votes of two-thirds of the members present. Eight to form a quorum.

Every member has the power of introducing two visitors, not being Students of the Hospital or School, to the evening meeting, with the consent of the President.

An ordinary meeting is held on the third Friday in every month, from October to March inclusive; the chair is taken at eight o'clock p.m. The annual meeting for the election of officers and other business held in January of this year, on the third Wednesday to receive the Treasurer and Secretary's reports.

THE STUDENTS SOCIETY OF THE VICTORIA DENTAL HOSPITAL OF MANCHESTER.

The object of the Society is the consideration of matters generally and specially appertaining to Dental Surgery.

The affairs of the society is managed by a Council consisting of a President, four Vice-Presidents, Treasurer, and Secretary, also two second and one first years' students.

The General Meeting is held on the first Thursday in every month from October to March inclusive and the Annual Meeting is held in January of each year on the first Thursday in the month.

Every member has the power of introducing two Visitors not being Students of the Hospital to a General Meeting, with the consent of the President.

METROPOLITAN BRANCH OF THE BRITISH DENTAL ASSOCIATION.

Composed principally of members of the British Dental Association practising within the London postal district. The Association meets about once every two months and the Annual Meeting is held in January.

The qualifications of Membership are similar to those in the other Branches.

British Journal of Dental Science.

No. 569. LONDON, OCTOBER 1, 1891. VOL. XXXIV.

DENTAL EDUCATION.*

By J. C. STOKOE.

Mr. President & Gentlemen,—After consenting to prepare a paper to be read before our Society, I was somewhat at a loss as to what I should take as my subject, until a suggestion was made that I should discourse on “Dental Education ;” as the subject appears to have excited a good deal of interest lately in the profession I adopted the proposal, not so much in the hope that I should be able to give you anything strikingly original, but rather that we might by a mutual interchange of opinions arrive at some conclusions which may be of use to us in the future and help us in any efforts we may make to elevate our profession and raise the standard of efficiency in those who form parts of it.

It seems to me that the subject is one eminently suited for discussion in a Society such as ours, inasmuch as we are in the habit of meeting here, not only those who are engaged in fulfilling the requirements of the curriculum (for it is mainly to this period that I shall have to confine my remarks, though of course a Dentist's Education is not at an end when he obtains his diploma) but also those who have passed through that period, as well as those who have watched the whole process of organizing the profession and who have had some hand in fixing the standards of its education and bringing it to its present position; looking at the question from such a variety of stand points we may surely hope for an interesting and profitable discussion.

Let me say at once that I am not in sympathy with those who contend that the curriculum should be narrowed down to the smallest possible limits, that nothing should be required that is not likely to have a direct bearing on the future work

* A paper read before the Students' Society Victoria Dental Hospital, Manchester.

of the profession ; by all means let us have those as dentists who are sufficiently well educated to be able to take an intelligent interest in the etiology and pathology of diseases not directly connected with the oral cavity, but which are nevertheless liable to cause systemic disturbances which may manifest themselves in that region ; and also of the manner in which disturbances may arise, which though apparently constitutional, are really local in origin, though general in their effects. A knowledge of such matters may often enable the dentist to be of great service to his patients, by removing troubles, which constitutional treatment has failed to cure ; at the same time, however, I contend that the fundamental requirements of every day professional practice, should have the first place, and that these rare and more complicated questions should not have an undue prominence given to them.

In speaking of the requirements of the various examining bodies, I will not say much respecting the Preliminary Examination, the portal by which all must enter, except to reiterate the advice given recently in the *British Journal of Dental Science*, not to aim too low. The status of a profession must always depend upon the intelligence and education of its members, and it is much better where possible to take the matriculation examination of one of our Universities than to be content with one of the easier avenues.

This ordeal safely passed and the students' name duly enrolled at the office of the General Medical Council, the next thing to be thought of is the mechanical training, by no means the least important, though perhaps the most difficult part of the Curriculum, because it is in many cases where men enter the profession without any previous knowledge of it, a matter of chance whether they enter a workroom where can be gained the needed experience. I believe a good mechanical training to be the best experience a man, who wishes to be a good operator, can have. I confess that I am unable to propose any remedy for the defects in the present system of pupilage. I scarcely think that the opening of Laboratories, however well arranged and fitted up, and the treatment of mechanical cases at our Hospitals will meet the whole case, as the work done there cannot be of that varied character which is met with in a good class practice, nor is it easy to imagine how a scheme could be inaugurated by which the superiority of one man over another, in the matter of training pupils, could be made known to those interested,

probably a combination of the two methods of instruction will eventually prove to be the best solution of the difficulty, my experience would lead me to recommend a pupilage in a practice of moderate size where the principal and pupil could do all the mechanical work between them as in such a position the latter is, I think, more likely to be entrusted with the more advanced part of the work, than in a large work room where there are two or three skilled mechanics over him. The recent action of the College of Surgeons of England has made it increasingly necessary that this part of the training should be thorough, the authorities there are evidently determined to take very little on trust in the future, and the period of mechanical training must not now be what it would seem in some instances to have been in the past, practically holiday. I note that in the new regulations of the English College, a proviso is continued which does not seem to exist at Edinburgh or Glasgow, and the authors of which would probably have some difficulty in logically defending, viz :—that qualified surgeons are only required to spend two instead of three years in learning mechanical dentistry, can any gentleman suggest what there is in Surgery which predisposes a man to mechanics.

To turn now to the second part of the curriculum, we may roughly divide it into three parts :—

- (a) Dental Hospital Practice.
- (b) Lectures, Dissecting, &c.
- (c) General Hospital Practice.

With regard to the first and most important, the tendency is evidently in the direction of more systematic training. It seems to me that demonstrations should form a very important part of the instruction there. Take the question of gold filling, the most difficult part of the operative work to a beginner ; it is quite possible for a student after he has done his work to find that he has infringed one or more of the accepted standards, either in the shape, &c., of his cavity or insertion of the gold, without being aware of the fact, a difficulty which occasional demonstrations, with explanations of the various methods of procedure would enable him to surmount.

With regard to the second division, I will say at once that I consider the alterations in the requirements of the English College distinctly a step in advance ; though we have not yet arrived at perfection, there is a marked tendency to make the

examination and the preparation for it more practical, as, for instance, the abolition of the second course on Anatomy, lengthening of the period of dissecting, and insertion of the new item, "Practical Physiology."

It would, however, be an advantage to the dental students if some of the lecturers would bear in mind the fact that there are some in their classes who only attend one course, as it is rather annoying when some important part of the series is passed over with the remark that it was taken last year, and will be taken again next year. The provision made for the attainment of a knowledge of chemistry before entering upon the regular course at the medical school, is I think wise, as this science forms such a basis for others, and some knowledge of it is so necessary for the comprehension of the phenomena met with in other directions, besides the fact of the saving of time, if this part of the course is taken beforehand. Of the other subjects little need be said except that *materia medica* seems to be left in an unsatisfactory position; as it stands at present the course of lectures is abolished, and the information may be obtained elsewhere than at the medical school, though I imagine that there are few other places where it can be procured; of course much depends on what the authorities require, and I should advocate either the establishment of a separate short course on Dental *Materia Medica* and Therapeutics, or the incorporation with the course on Dental Surgery, of an account of the origin, preparation, properties, &c., of the substances which enter into the dentists' catalogue of drugs, as although a course of lectures in medicine may be desirable, the dentist will never be called on to treat the diseases there spoken of. Before leaving this part of the subject, I will refer with satisfaction to the forthcoming inauguration of a new course at the Manchester school which already exists at some of our teaching centres, namely the lectures on Operative Dentistry, I have very little doubt that before long this course will be made compulsory, and think that such a regulation would be for the benefit of the profession.

As to the third of our divisions, the General Hospital work, I think that in the requirements for the London Examination a change is desirable. It is of very little use to make a student attend clinical lectures and ward classes till he knows a little of anatomy and physiology; at least the first winter of this work is practically wasted time, and while I would not advo-

cate the abolition of this portion of the curriculum, I think, that if the period of six months required at Edinburgh and Glasgow were made general, with the *proviso* that it should not be taken during the first winter of attendance at the Medical School, much good would result. I think we have a precedent for this in the regulations for the conjoint examination, where it is, I believe, stipulated that these items must not be taken until after the passing of the second examination.

I do not propose to discuss the examinations at any length, but merely to touch on the question of the advisability of dividing the one in London into two parts ; personally, though I should deprecate the splitting of it up into a number of sections. I favour the division into two, though there is something to be said in opposition ; it seems hard that a man who has done well in either his general or dental work should be obliged to keep up all the details of one because he failed in the other. I fancy that this change will be found inevitable as soon as the new regulations are worked upon, as no doubt some test of the knowledge possessed in chemistry, &c., will be required, and then the work will be found too much for one examination.

Time will scarcely permit of the discussion of the question of a "Higher Qualification ;" those who desire further information on the point, I cannot do better than refer to the excellent paper by our President, Mr. G. G. Campion, and the discussion thereon at the Exeter meeting of the B.D.A. The discussion was nearly all on one side, and that, I venture to think the wrong one. It seems to me that if a gentleman after obtaining the L.D.S. wishes some further proof of his ability, there should be some examination open to him, the passing of which will be a guarantee of greater efficiency in his profession and also be attainable without the necessity of entirely giving up two or three years of valuable time to the acquirement of the necessary information, these requirements the Diploma of the Conjoint Board can never fulfil, the F.R.C.S. is a guarantee of increased knowledge of Surgery on the part of one who has taken his M.R.C.S., but the L.D.S. with a medical qualification does not necessarily know more of dentistry than another who has it not, and it is, by the way, not very encouraging to find that, judging from some recent events, it is almost a necessity, at least in some quarters, for anyone who has a desire to hold any public appointment, to go to the trouble and expense of obtaining the double qualification. I hope the day

is far distant when it will be necessary, in order to secure a dental qualification to first obtain a medical degree, I cannot think that this would be to the advantage of either of the professions or of the public.

In conclusion, Gentlemen, I trust that, though introducing my subject in a somewhat crude and imperfect manner, I have been able to bring forward some points which will lead to a useful and profitable discussion.

PYORRHŒA ALVEOLARIS *alias* RIGG'S DISEASE.

By WM. R. TUCK, L.D.S., Truro.

I am at a loss to know on what ground Rigg laid claim to the discovery of this affection, which was known to practitioners of dentistry, anterior to the days of Dental Hospitals. It may seem a new form of disease to teachers of the modern School, but I may say, that when quite a young man these aberrations or deviations from health would frequently come under notice ; but the pseudonymous heading "Pyorrhœa Alveolaris, or Rigg's Disease" would be unknown to the present generation. The loosening of teeth by atrophy of the alveolar process, clearly shows the non-purulent or sanious discharge, and this proves the decomposition to be different from abscess such as in an ordinary case may be due to necrosis. The origin of the mischief did not at that time claim much attention, and simple local treatment such as lotion of sulphate of alum as a gargle, was considered all-sufficient for it. In process of time, seeing the lamentable destruction of teeth (though perfectly sound) from this cause, I devoted much time and study to the subject and then formed my opinion as to its etiology and treatment which was, and still is, totally at variance with those who profess to be authorities on such matters at the present day.

These ideas were partially engendered by reading a treatise of the late Dr. Prout, an eminent surgeon and specialist in renal diseases, who by his assiduous chemical researches fully demonstrated that with a certain idiosyncrasy of constitution chloride of soda, *i.e.* (common table salt) so abundantly employed in every article of food, (especially in our present conventional mode of living), became decom-

posed in the stomach, the soda being thrown off and the free acid (Hydrochloric) is regurgicated. This led me to experiment in this particular direction. I soon had the satisfaction of being enabled to endorse that gentleman's theory which in most cases can easily be tested by the use of Litmus Paper, with this remarkable discovery before me, I arrived at the conclusion, that the wasting of the bony environments of teeth resulted chiefly from the action of almost free Hydrochloric acid. I have at present in my possession ten upper teeth which dropped from the mouth of a lady, each being entirely free from disease. This chemical change was also referred to by the late Dr. Budd in his Treatise on "Organic and Functional Diseases of the Stomach" it was not in the province of either of these gentlemen to extend their observations further than perhaps to notice the tongue, diseases of the teeth clearly belonging to a different branch of science. In closing this note I have only to say that in the incipient form of such disease the neck of the tooth at first becomes denuded of its surroundings. This is the most favourable time to commence treatment. I advise immediate use of Alkalies internally and Gargles of Sodæ Biboras and Carbolic Acid with a very moderate use, *if any*, of the saline condiment often used with such great excess.

MANAGEMENT OF THE THIRD MOLAR WHERE THERE IS
OVERHANGING GUM.

By DR. A. W. HARLAN.

With reference to the management of the third molar tooth after it has erupted, or after it has nearly erupted, when there is overhanging gum. If any cutting is done it must be done in the most liberal manner. I take a long pair of curved scissors, and slit the gum back beyond the distal side of the molar, and then I clip off generous quantities of the gum on either side, and then treat the surface with ethylate of sodium to still further destroy the tissues that may be inexpedient to get at. Ethylate of sodium will destroy tissue without injuring the tooth. Nitrate of silver will not do it well. Chromic acid when it does do it, will do it at the expense of the surface of the tooth. Chloride of zinc it is not possible to use well; sulphuric and other acids it were better to leave out of the mouth.

Chic. So., Review.

British Journal of Dental Science.

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THE RELATIVE VALUE OF DIFFERENT DIPLOMAS.

ONE of the evils of the present system of the same diploma, degree or license, being issued by different bodies, is at once apparent when we try to estimate the relative value of each. Take the Royal Colleges of England, Ireland, Glasgow and Edinburgh, each of these grant diplomas licensing the holder to practise medicine or dentistry, as the case may be, and also grant the fellowship of the college to candidates, after due examination. Now the relative value of these fellowships, or other diplomas must, of course, depend on the severity of the test examination, unhappily this is by no means equal, it varies, at some colleges being more severe than at others, yet the diploma granted bears the same name; in the case of the dental one, it entitles its holder to call himself a "Licentiate of Dental Surgery of the Royal College of Surgeons," or, to use the abbreviation in common acceptance, he is an L.D.S. Now this of itself does not tell whether he is a licentiate of the English, the Irish, or the Scotch Colleges, and it has been customary to take the plain L.D.S. as meaning a licentiate of the English college and to add I. ; Glas. ; or Edin ; if the graduate be either of the Irish, the Glasgow, or the Edinburgh College. This is a very desirable custom and one with which we should hope all will agree, for but little consideration is needed to show the hopeless confusion, which would arise, should no such distinguish-

ing sign be used. At the same time it is logically impossible to insist on the adoption of this system. An L.D.S.I. has as much right to style himself plain L.D.S. as has an L.D.S. Eng. This point has lately arisen in connection with the F.R.C.S. A correspondent of the *Lancet* objected to the use of the plain F.R.C.S.; by any but fellows of the English College, his points being that universal consent favoured such a limitation, and that to ignore this was to wilfully mislead. This letter has called forth others from men who object to this limitation on much the same grounds that we have already mentioned, a F.R.C.S. is as much a F.R.C.S., whether he be of England, Ireland or Scotland and the use of any distinguishing mark must, we take it, always be one granted by courtesy, rather than on technical grounds.

It is curious to note that while a Fellow of the English College, which is usually accepted as being of the most value, wishes to, and does use the F.R.C.S. without the affix, the Doctor of Medicine of the London University, certainly the most difficult doctorate to obtain, always uses an affix, "Lond," after his M.D. It will, we think, be found as a rule that simply M.D., signifies a Doctor of one of the less distinguished Universities. We cannot help thinking that it is very desirable, that some hard and fast rules should be drawn up and adhered to. It is eminently desirable that there should be competing Colleges and Universities. The one stimulates the other. And this quite apart from the question as to the need, or otherwise, of one central state controlled degree granting body. We fully see the need of such an institution as this, but even when a man is qualified to practise, as far as the possession of a diploma is concerned, he still feels the need of further study and work, and desires that he may be able to obtain recognition of this extra work by taking some of what are usually called, the higher diplomas.

Turning back, for a moment to the question of the dental diplomas, we are glad to note a greater tendency towards an

equalisation of the test examinations, which qualify for the possession of these diplomas. We hope this is a growing tendency. We cannot see why, failing incentive and instructions for above, the examiners should not come to some understanding between themselves, so as to attain this very desirable object.

The controversy on the drink question has produced at any rate one letter which is of interest to dentists. It is written under a *nom de plume*, but is to the point in the paragraph we reproduce.

“Bad teeth cause an enormous number of drunkards by promoting indigestion, dyspepsia, debility, nervousness, and consequently a craving for alcoholic stimulants as a relief from these depressing maladies: therefore good teeth mean good digestion and less drunkenness. I have been waiting, fully expecting that some of your correspondence would reveal this. Let the dental hospitals be established in every quarter, where false teeth could be obtained gratis when necessary. Let all doctors first examine the teeth of their dyspeptic, debilitated patients, and, if found defective, begin treatment by having them set right. I know of several cases of excessive drinking resulting from such cause—one in particular, some years ago, of a young married lady in the country who was discovered to be consuming a bottle of strong brandy a day; she could not exert herself in any way without first taking a glass of spirits, and before starting for daily horse-exercise two or three glasses. Her local doctor, who was treating her for debility, in his despair sought advice by letter from a physician in London, an old mutual friend of both families. He replied, simply asking, “How are her teeth?” This gave the local medico the cue; the lady’s teeth were found to be useless for mastication. A false set was furnished; her craving for brandy forthwith ceased, her recovery was rapid and effectual, and at the present moment she is a healthy, comely woman, with a large family of children, and a thorough hatred of alcohol in any form. Dental Hospitals should be considered the most

important of all special hospitals ; so much of the general health depends upon the state of the teeth."

Undoubtedly there is much weight in these remarks, though it is not always the lack of means to obtain dental services, which is the cause of people not doing so. Undoubtedly there is need of efficient aid to the poor, especially in the provinces, but many who are not poor will not avail themselves of the help they could so well afford to pay for. Moreover, we doubt whether a Dental Hospital would be the most economical way of providing this relief. It means expense in many ways, and the money could equally well be spent in paying some young practitioner a low fee to undertake the work.

THE question of whether to treat a case of cleft palate by operation or by mechanical means is of importance. Mr. Morgan in a clinical lecture at Charing Cross Hospital made the following remarks on the latter mode of treatment :—

"There are several serious drawbacks to the application of such apparatus to the young. The initial proceedings are most difficult and troublesome, and do not repay the labour that they cost ; and in the next place a plate once made for a child needs to be renewed at frequent intervals, because the constant pressure of vulcanite or any similar material causes the cleft to widen, and so the apparatus becomes loose and admits particles of food into the nasal cavities, where they set up irritation, and often ulceration. Besides this, the wires which secure the apparatus cause injury to the teeth round which they are fixed, and do irreparable harm. But a greater objection is that any such obturators tend to prevent the natural tendency to these parts to contract, and by pressure on the soft tissues indurate them to such an extent that no operative treatment can be undertaken later. I once was prevailed upon to operate on a young gentleman who had worn a plate from an early age, and the tissues, instead of being soft and vascular, were almost as hard and as free of vessels as a piece of cartilage. It was of great importance

that, if possible, the cleft should be closed, and this I succeeded in effecting after three operations, and he passed into the Indian Army, in which he is now an officer."

Mr. Morgan is of opinion about three years of age is the most favourable time to operate, but a time should be chosen when the gastric system is healthy and when there is no irritation from the cutting of a tooth. Even if there may be partial failure in union at the first operation, this is usually overcome by a second effort. In fifty-eight cases in which he has operated the fissure was entirely closed in thirty-four, there were five failures, and in nineteen partial union was obtained ; many of these he considers might have been wholly cured had they presented themselves a second time.

A number of deaths under chloroform, when given as an anæsthetic, have lately been recorded. It is not, however, often that one has to record deaths from an overdose, given purposely or accidentally. Such an one has recently occurred at Southport.

Charles Edward Cadogan Masterman, aged sixteen, second son of Dr. Masterman, who was home for his holidays, had been suffering from toothache. On Sunday morning he went to church, and afterwards had dinner with the family, but afterwards was missing, and his brother found the door of his room locked. Dr. Masterman, forcing the door open, found deceased lying on the floor dead, with a bath-towel wrapped round the lower portion of his face, and a strong smell of chloroform pervaded the room. Deceased had been in the habit of using chloroform in the study of natural history, and no doubt used it to allay the pain from his tooth. At the inquest held on September 9th, the jury returned a verdict of "Death from misadventure."

Abstracts of British & Foreign Journals.

THE RHEUMATIC AND GOUTY DIATHESIS AS MANIFESTED IN THE DISEASES OF THE PERIDENTAL MEMBRANE.

By Dr. J. S. MARSHALL.

NEARLY all text-books on dental pathology and surgery mention that rheumatic and gouty individuals are liable to suffer from irritation of the peridental membrane, causing the teeth to become more or less sore and loosened in their sockets, presumably the results of that diathesis.

Clinical and post-mortem experience teaches that the *materies morbi* of these diseases has a predilection for the fibrous structures of the body, especially the synovial membranes, the aponeuroses of muscles, the dura-mater, the cardiac tissues, periosteal and peridental membranes. The one most commonly affected is the synovial membrane, resulting in inflammatory conditions of the joints.

It not uncommonly happens, however, that there is associated with the inflammatory phenomena of the joints enlargement of the long bones and nodular formations in other localities; and in the pericementum, conditions which are somewhat analogous.

The predisposing and exciting causes of certain irritative conditions of the pericementum seem to have their origin in the same conditions which bring about the phenomena of gout and rheumatism, and they have also proved by experience to be amenable, in many cases, to the same specific treatment adopted in these diseases. This last fact has led to the belief that the rheumatic poison is largely accountable for many of the diseased conditions of the pericementum, and has led to close and careful observation being made for several years in relation to the prevalence of irritation of the pericementum in gouty and rheumatic individuals. This belief has been further strengthened by finding, upon analyzing the urine of a number of persons suffering from peridental irritation of this character, that there was a considerable excess of uric acid in every case. The saliva also, in many cases, gives a decided acid reaction.

The peridental membrane seems to be very susceptible to the irritating effects of an acid condition of the blood, whether

from an excess of lactic or uric acids retained in the system or from the ingestion of such acids as are formed in sour wines and malt liquors.

The habitual use of sour wines and malt liquors often results in peridental irritation of a marked character in individuals who have never developed symptoms of a rheumatic condition; while on the other hand the same irritative conditions are found in total abstainers : but these, it would seem, are due to rheumatic phenomena, and are often the forerunners of an approaching attack of acute articular inflammation.

Congestion and thickening of the peridental membrane and temporary loosening of the teeth, accompanied with dull, gnawing pains and more or less soreness, are a common occurrence in rheumatism and gout. At times this condition is the first definite symptom to be manifested of an approaching attack of acute articular inflammation, while in others it does not make its appearance until after the first acute symptoms have subsided, and occasionally it is the only manifestation of this peculiar diathesis.

Chilling the surface of the body, or in other words taking cold, is usually the exciting cause of an attack, while an injudicious diet greatly aggravates it.

The presence of concretions upon the roots of the teeth is the most common cause of inflammation of the pericementum, and it has been generally supposed that these concretions were formed from the saliva.

The following seems to be a more rational explanation of the formation of these deposits in locations inaccessible or nearly so to the saliva. The saliva contains, as waste products, a certain amount of phosphate and carbonate of calcium, which have been rendered soluble by the action of carboic acid. A certain amount of ammonia is given off from the lungs as a product of decomposition of tissue; while fermentation of alimentary debris lodged about the teeth also furnishes an additional amount of ammonia. This ammonia coming in contact with the saliva of the mouth unites with a portion of the carbonic acid to form carbonate of ammonia, thus liberating a portion of the calcium, which is thrown down in the form of a precipitate and lodges upon the exposed surfaces of the teeth. But when deposits occur at remote points from the gum-margin, it does not seem possible that this is the correct explanation of their presence in these localities. The law of gravity carries downward

all bodies that are heavier than the medium in which they are suspended, consequently we must look for some other explanation for the presence of the deposits on the roots of the superior teeth.

Capillary attraction may possibly account for their location, but this seems hardly probable, for it presupposes the presence of a pocket, or a separation of the pericementum from the cementum, while the amount of saliva entering such an existing *cul de sac* would be extremely small, and not likely to be changed at sufficiently frequent intervals to account for the rapid accumulation which takes place in some of these cases. We are forced, therefore, to the supposition that they are deposited from some other source, and under an entirely different group of circumstances.

It has been suggested by Dr. Ingersoll, of Keokuk, Ia., that these concretions were a direct deposition from the liquor sanguinis which bathes the roots of the teeth during the suppurative stage of the inflammatory process. This may be the correct solution. It is true that calcareous material is sometimes deposited from pus, in proof of which might be mentioned the fact that the roots of teeth penetrating the antrum of Highmore and foreign bodies located in this sinus during suppurative inflammation have been found when removed to be covered with calcareous deposits; but that this is a common occurrence in suppurative conditions in any locality, admits of serious question. The deposition of the concretions upon the roots of the teeth, in those localities not readily reached by the saliva, or in which the presence of the saliva would be an impossibility, is due to the causes which produce the chalky formations found in the joints and fibrous tissues of gouty and rheumatic individuals.

The thought has occurred, though time has not been sufficient to demonstrate it positively, that the concretions found upon the roots of the teeth in the locations just named were masses of urate of soda with phosphate and carbonate of calcium, and that they are deposited directly from the secretions, as is often the case in rheumatic arthritis.

Furthermore, it would seem that these concretions were the cause of the inflammatory condition, rather than the result of it. In proof of this, clinical observation teaches that suppuration often occurs about the roots of the teeth at remote points from the gum-margin, which points have no outlet until the pericementum is dissected from the

roots of the teeth by the accumulation of the pus. Cases are seen in the lower jaw in which an abscess had been formed upon the roots of living teeth,—between the neck and the apex,—and in which the attachment of the gum at the neck of the tooth was intact and the pus did not escape until nature had perforated the soft tissue, or relief was given by the use of the knife. In such cases are always found concretions upon the root at the point of suppuration; this could not possibly have been deposited from the saliva, and it is fair to presume that the deposits upon the root were the source of irritation that produced the abscess, rather than that the inflammatory condition was produced by some remote cause and the formation of the deposit the result of the inflammation.

Dental exostosis, or hypertrophy of cement-tissue, is an occasional occurrence in individuals of a gouty or rheumatic diathesis. It is most commonly found in chronic cases of long-standing, and is often associated with enlargement of the joints.

The causes are in all probability the same as those which produce the enlarged joints. Chronic irritation of the periosteum tends to hypertrophy of bone; while the same condition of irritation in the pericementum produces hypertrophy of the cementum. The history of these cases is usually one of chronic irritability of the pericementum with periodical attacks of soreness and looseness of the teeth, while the cause of each attack is generally referred to some recent exposure in which the individual has taken cold. The acid reaction of the saliva and the urine at these times gives evidence of an acid condition of the blood. This would seem to indicate the cause of the irritation and suggest the line of treatment to control the immediate symptoms and the prophylaxis of the future.

Phagedenic pericementitis is sometimes directly traceable to a rheumatic condition of the system, or the uric-acid diathesis. In several cases in which he had analyzed the urine, uric-acid was found largely in excess of the normal quantity.

In all of the cases classed as rheumatic, concretions were found upon the roots of the teeth, and many times in locations which precluded the possibility of a salivary origin.

Under restricted diet in which meats, wine, and malt

liquors are cut off there is soon a marked diminution of the quantity of uric acid excreted, and an equally marked improvement takes place in the symptoms manifested in the oral cavity, which cannot be accounted for by the removal of the oral symptoms is a sure indication of the presence of an excessive amount of uric acid in the urine, and as soon as this condition is corrected the inflammatory conditions of the pericementum are greatly relieved. Local treatment is necessary, but this alone is not sufficient; we must strike deeper and correct the morbid condition of the system if we hope to effect a cure.

Cosmos.

FRENCH DENTAL JOURNALS.

L'Odontologie for July contains a short article by M., VIAU entitled "A CONTRIBUTION TO THE TREATMENT AND FILLING OF CANALS." He begins by declaring himself an advocate for Iodoform, for I find it," he says, "superior to other antiseptics employed in dentistry in not becoming decomposed even after prolonged sojourn in pulp cavities; I have had opportunities on several occasions of seeing teeth filled several years previously, and have found that the iodoform crystals retain their original appearance as well as their characteristic odour." He used to use iodoform held in solution, or rather in suspension, in creasote, but a few months ago the thought struck him of adding chloroform to this mixture, and was astonished to find the liquid became dark yellow or brownish in colour, while the characteristic odour was almost lost. He uses the mixture on wisps of cotton wool for disinfecting the canals. He affirms that in the case of sensitive or painful roots, due to periostitis this dressing has a soothing effect, probably due to the iodo-chloroform vapour which passes through the apex of the tooth. He considers it an advantage for the dressing to be semi-volatile as it then permeates more readily the tissues of the tooth especially after drying the canal with heat. He also uses this solution when inserting his final gutta-percha plugs. He makes his own gutta-percha points, using for the purpose

Ash's pink impression gutta-percha, which is very soft. By dipping these points for a moment in his solution, he finds they fill the canals more thoroughly and easily, and are at the same time permanently antiseptic.

M. LEHR records a case of DENTAL CYST, cured by a most formidable operation. The cyst was connected apparently with the four upper incisor teeth, which were somewhat loose, and on percussion yielded a dull note. The swelling was in the roof of the mouth and extended back as far as the 1st, or 2nd molars. The character of the swelling was hard in parts, and yielding in others. The swelling extended beneath the nose, where fluctuation was detected ; here it was painful to the touch, and prevented the patient blowing his nose. The patient refused to take M. Lehr's advice to have the teeth extracted, and after enduring it for more than a year, during which time the swelling gradually increased, underwent a surgical operation, in which not only were the teeth removed, but the whole of the bone between the canines, and as far back as the molars was removed also. This seems like heroic surgery with a vengeance !!!

M. VIAU reported to the *Societe Odontologique de Paris* two cases of abnormality. The first was as he calls it, two supplementary wisdom teeth in the upper jaw. The patient was a lady; all the other teeth were normal ; these supplementary teeth were situated on the outer side of the alveolar ridge between the 2nd and 3rd molars, were about the size of temporary canines, but had one four, the other three cusps of enamel. His second case was THE ERUPTION OF A CANINE AT 70 YEARS OF AGE. The patient was wearing an artificial case which had been quite comfortable for six years. Then in the region of the canine on the right side the gum became sore and swollen ; the plate was eased, but in a little while the patient returned to have it eased again. After this had gone on for some time a distinct ridge was visible on the gum in that region. M. Vian cut down through the gum, and came on something hard, which proved to be a canine tooth, which was eventually extracted with great difficulty. The tooth was lying almost horizontally.

WE gather from *L'Odontologie* that the delegates appointed by the Association General des Dentistes de France, to lay their views on the proposed Law of Regulation before the Committee of the Senate had a most favourable reception. Dr. David, the deputy for the department of the Alpes-Maritimes, was present at the sitting of the Committee, and made a speech strongly in support of the delegates of the Association. This was all the more noticeable as he was formerly a strong advocate for compelling all dentists to take a medical diploma. He accounts for his change of opinion by saying that during the seven or eight years he was connected with the dental school of Paris, he became convinced that kept within its true limits the profession of dentistry could be perfectly well practised by persons not graduated in medicine, and therefore he supported the scheme for the establishment of a special dental diploma. He was strongly in favour of regulation, for by that means alone could they raise the standard of the profession, give to dentists the position they deserved in the social scale, and above all enable them to fight against the illegal competition of foreign dentists. On this point, dentists, public opinion, and the Government were all alike unanimous. When the question of practice was settled, and the Government took in hand the question of professional education, they would find in the dental schools material already existing which had given proof of its trustworthiness, and of which they would be only too glad to take advantage.

NECROSIS: ITS MICROSCOPICAL APPEARANCE, CAUSES, AND TREATMENT.

By D. M. SABATER, A.B., D.D.S., M.D., New York, N.Y.

THE word necrosis is derived from the Greek *νεκρός*, a corpse. Before entering into the details of the condition, I will briefly touch on the points of difference between this disease, gangrene and caries. In necrosis we have devitalization of the histological elements of bone, in gangrene devitalization of soft tissue, with formation of slough. Caries of bone shows deterioration in quality, due to a collection of fat-

globules with impaired physiological action of bone-cells, and presents two-thirds animal matter to one-third earthy, while in necrosis four-fifths are inorganic to one-fifth organic.

The differential diagnosis between these two diseases is easily made by means of the probe, the former showing softness, and the latter grittiness. Between healthy and necrosed bones, in probing, there is recognized a certain yielding of the necrotic process, while in the former there is resistance and a springing back of the probe upon touching it.

Under the head of necrosis we have two forms, the exfoliatory or proliferal, and the sequestered or mixed. The first attacks only the surface and cancellous structures, as the alveolus, and is most commonly met with in children. The only antecedent is inflammation, induced by some local irritation through disturbance of the cell element of the affected parts. This inflammation reaching the periosteum, when followed by suppuration, cuts off the vascular supply; the bone-cells become inflamed, causing an increased functional activity, with increased deposition of earthy salts, which produces closure of the canaliculi and compression of lacunæ, and the bone-cells die.

It has been stated by several writers that the superior maxilla, being richer in its blood supply and more protected than the inferior, is less liable to this disease. We might safely say that out of one hundred cases of necrosis of the maxillæ from seventy-five to eighty are seen in the lower jaw, and with greater tendency to enlargement and destruction, and disfigurement of the face by an external opening, due to the gravitation of pus in some cases.

I here present specimens, sections of which under the microscope show as follows:

The necrotic piece of the upper maxilla shows a remnant of the outer cortex in the shape of a soft, corroded lamella of the thickness of writing-paper; all the rest is made up of cancellous bone discoloured to a dusky grayish-brown and irregularly corroded. The whole piece is of a soft consistence and extremely brittle, which goes far to prove that here the necrosis was the result of a long-lasting, chronic, suppurative periostitis and osteitis, which not only has corroded the bony structure, but also has led to a dissolution of the lime-salts to a considerable degree, causing a softness and brittleness of the whole piece. The thin cortex could be directly transferred in a small slab under the microscope, easily yielding to slight

pressure exerted over the cover-glass. This slab showed much enlarged, irregularly-bordered Haversian canals, mostly in an empty condition. The enlargement of the canals was in many places of such a degree as to bestow upon the bone-tissue a honeycomb appearance.

The lacunæ and canaliculi of the remnant of bone-tissue were found enlarged also, but empty and devoid of protoplasm.

The cancellous structure is likewise much corroded, and made up of thin and irregular bony trabeculæ. No trace of the previous medullary tissue was found.

The basis-substance of the necrotic piece of bone has lost its lamellate structure, and holds only small granules of lime-salts, pierced by the canaliculi, nowhere traceable in large numbers. This fact again proves that a somewhat chronic process of osteitis has preceded the necrosis, leading to a far-advanced decalcification of the basis-substance of the bone.

The necrotic piece of the inferior maxilla is on its outer surface pretty smooth, though entirely deprived of periosteum; only here and there are found irregular erosions caused by osteitis, though nowhere extensive or penetrating very deeply. The inner surface has the aspect of cancellous structure with deeply-eroded bays, the bony trabeculæ being of dark grayish-brown colour and mostly of the consistence of bone-tissue. The outer cortex shows in its minute structure but few symptoms of acute inflammation, but obviously has been rapidly deprived of its life by suppurative periostitis. The Haversian system is well preserved and contains almost unchanged central canals filled with granular detritus, and exhibiting traces of the previous capillary blood-vessels. The bone corpuscles are likewise unchanged in size and shape, but instead of nucleated protoplasm they show a finely granular detritus, many of them having disappeared and left behind empty lacunæ and canaliculi.

The interior cancellous structure has been the seat of intense acute osteitis, preceding necrosis. The trabeculæ are much reduced in bulk, and their contours show a large number of bay-like excavations partly filled with micrococci and partly empty. The remnant of the trabeculæ exhibit much enlarged, irregular lacunæ, lacking bone-corpuscles altogether. Many lacunæ have assumed the size of Haversian canals, being, however, in no direct connection with the large former medullary spaces. Such enlargement of the lacunæ is known

to be the result of acute osteitis. The dissolution of the lime-salts did not make much headway, except in the bay-like excavations at the border of the trabeculæ and in their middle. For this reason the consistence of said trabeculæ is that of bone tissue, generally the difference being in their extreme brittleness. No trace of the previous medullary tissue was found, but only granular detritus and colonies of micrococci in its stead.

Causes.—1. From long-standing alveolar abscess. 2. Some obstinate ulceration of the mouth, as ptyalism, from mercury. 3. Syphilis, seen often at the palatine process of the superior maxilla, alveolus, or body of the bone; very seldom in the lower maxilla. 4. Absorption of the fumes of phosphorus; this form is in some cases very destructive; it is seen in the upper, but most frequently in the lower jaw, occasionally in both. 5. Exanthematous fevers, as typhus, small-pox, scarlet fever, especially the latter, and frequently met with in children. 6. Improper handling of certain drugs, as arsenic. 7. Eruption of the third molars, in cases of small maxillæ and large teeth; hence insufficient room. 8. External injuries, as blows, fractures, etc. 9. Traumatic injuries, as in cases of careless extraction of teeth. 10. Pressure of foreign bodies. Finally, to have necrosis there must be a certain predisposition of the patient by a run-down constitution and depression of vital power.

Treatment.—From the beginning of the inflammatory stage all causes of irritation should be removed, using antiphlogistics and brisk saline cathartics. Should necrosis take place regardless of this treatment, constitutional as well as operative methods will be required; strong tonics and the most nutritious diet; plenty of exercise in the open air; in old persons give stimulants moderately. Judicious incisions should be made in some cases for the free escape of pus. Free use should be made of antiseptics, of which several are recommended, as carbolic acid solutions, phènot-sodique, listerine, potassium permanganate, creoline, boracic acid, etc.; but the most efficient are bisulphite of soda, aromatic sulphuric acid, trichloride of iodine, hydronaphthol, pyoktanin, peroxide of hydrogen, and hydrargyrum bichloride solution, to inject and wash thoroughly the affected parts.

Some writers and practitioners advise the early removal of the sequestrum by scraping or burning out the area involved; while others advocate prophylactic treatment till nature throws

off the sequestrum and the embolucrum has properly developed. I think that the former treatment is by all means the best, because by judiciously and properly burring out the necrotic pieces and reaching healthy tissue you get a fresh wound which under proper circumstances nature will soon heal by first intention.

In cases of syphilis, besides the local, a mixed treatment is advisable, consisting in the administration of mercury, either the proto-iodide or bichloride, with potassium iodide.

In anæmic cases give iron; but should this be in a liquid form, always follow its use with a strong alkaline mouth-wash.

Before concluding, I will relate a peculiar case of office practice: Miss L. V., from Nicaragua, Central America, suffering from necrosis of the right inferior lower maxilla (molar teeth, area involved), caused by an alveolar abscess from the second molar. Under treatment from June 3 until September 8, 1886, when the last piece of sequestrum was removed, and the parts were healing nicely.

The peculiarity of this case was the fact that every twenty-ninth or thirtieth day a marked dullness suddenly appeared on the affected side, with an increased inflammation and suppuration, regardless of treatment, this alarming condition only lasting two or three days. The sinus and cloaca were perfectly free and open, consequently there was no retardation of pus which would give rise to such temporary disturbance. After careful investigation of the case, I came to the conclusion that the only cause of this increased symptom was a physiologically disturbed systemic condition furnished by nature.

Cosmos.

PYORRHŒA ALVEOLARIS.

By G. ED. HYNDMAN, D.D.S., L.D.S., Sherbrooke, Que.

PYORRHŒA alveolaris, commonly known as "Riggs' disease," is a suppurative inflammation of the gums and peridental membrane, attended in acute cases with the destruction of the alveolar process, and resulting in the loosening and finally in the loss of the teeth.

The first indication to the patient of a pathological condition is an uneasy sensation in the gums and teeth, which, if not attended to with care, soon becomes painful, and the margin of the gums appear decidedly inflamed and bleed from slight causes.

As the disease progresses the inflammation extends deeper into the tissues, and they become congested with venous blood, swollen and have a tendency to separate from the necks of the teeth.

The separation of the gums from the cervical portions of the teeth gives rise to the formation of small sulci or pockets, thus permitting the retention of pus and micro-organisms which become a further source of irritation to the peridental membrane and alveoli.

As the destruction of the alveolaris progresses the teeth become loose, and if the teeth affected by the disease be the incisors, they will usually protrude and separate from each other. There will be a viscid, fetid discharge, which will cause a disagreeable taste, and give the breath a very offensive odour. The gums will be of a purple or livid hue, with congested margins, which are sometimes denuded of epithelium, giving them a polished appearance. The roots usually become coated with calculus, which is of a greenish-brown colour, and adheres to the teeth very firmly, and is sometimes in such thin scales as to render its removal very difficult. Of the two forms of calculus, salivary and serumal, the latter is more commonly associated with this suppurative inflammation than the former.

This pathological condition of the tissues about the teeth causes a serious exudation and diapedesis of the white blood corpuscles, which all combine to form this harder variety, known as serumal calculus.

Although pyorrhœa alveolaris depends almost entirely upon local causes, yet it is affected, no doubt, by any unfavourable diathesis which may aid local causes in producing more serious results than would be possible under more favourable systematic conditions. Low vitality, and all diseases which affect the circulation, may be looked upon as predisposing causes of pyorrhœa alveolaris.

Dr. Black contends that this disease is of a purely local origin, while Dr. Atkinson believed it to be from constitutional causes. There seems, however, to be good reasons for believing with Prof. Truman, that the causes of this disease

are both of a predisposing and of an exciting nature. In the treatment of this pathological condition, all teeth and roots which are so badly decayed, or so loose, as to be past restoring to usefulness, should be removed at once, for if allowed to remain they would be a constant source of irritation. Then the removal of all deposits from the teeth is of very great importance, and on the thoroughness with which this part of the operation is done will depend, to a great extent, the results of further treatment. The removal of the deposits from the roots requires skill and patience on the part of the operator, for lying close against the sides of the roots there will be found very thin scales which are so smooth that their outlines are with the greatest difficulty detected by the touch; for this reason much care is required for their complete removal. This calculus is an irritant, no matter how small the amount, and any particles left will serve to continue the inflammation. The instruments for this operation should be narrow and slender, and formed with care and delicacy. The bulk of calculus may be removed by curved or hoe-shaped instruments, but for the removal of the last portions, or for serumal calculus, the instruments should be so formed as to work with a pushing motion, that is, they should work from the hand in the removal of concretions.

In cases where the alveolar process is affected and absorption has left the edges round and jagged, the edges which are rough and any particles of the process which are diseased should be removed. In doing this, care must be taken not to wound or cut away any portion of the gum margin, for upon the preservation of the gum depends for the most part the renewal of lost tissues. The root will remain denuded as far as the gum has been destroyed. The pockets formed about the roots should be injected with peroxide of hydrogen to cleanse the parts, and to remove pus and all foreign matter. To inject the peroxide of hydrogen, and, indeed, any of the remedies, use a syringe having a straight and a curved canula. The canula is to be well introduced at both the mesial and distal sides of the neck of the tooth, so as to cleanse the inter-alveolar parietes which form the seat of disease. I believe the use of the syringe for applying the remedy to the affected part to be of very great importance, for without it one cannot apply the agent used directly to the affected parts, except in a very dilute form.

After thoroughly cleansing the parts by the use of $H_2 O_2$,

inject the sulci about the teeth with a 20 to 30 per cent. solution of commercial sulphuric acid, which will be found very effective in constringing the gums and removing from the tissues that condition of extreme congestion. The acid should be allowed to remain for two or three minutes, and then neutralized by the use of carbonate of sodium. Syringe the parts with tepid water to remove all debris, and as a final dressing use sulphate of quinia made into a paste with some of the essential oils, as they are not so readily acted upon by the fluids of the oral cavity. This paste should be carried into every pocket where there is disease. If any of the teeth are loose, they should be supported by means of ligatures, or if they will require permanent support, gold clasps made to fit the teeth accurately and attached to some of the adjoining teeth will be found to give satisfaction.

The patient should be seen, at least, twice a week, so that the parts may be washed out with H^2O_2 . This may be followed by the injection of phenol camphor, or with a solution of one part of carbolic acid to two parts of oil of cinnamon which will be found more agreeable. This treatment is to remove septic matter and to stimulate the tissues to their normal vitality. Usually when a decided disposition to heal is shown, the treatment may consist in simply keeping the parts free from foreign matter. The patient should have a wash which has stimulant and disinfectant properties, and for this purpose the following wash is good : Oil of cinnamon, 1 part ; carbolic acid, 2 parts ; and oil of gaultheria, 3 parts. This may be diluted with lemon oil to about one-half its strength, or may be used without dilution by placing half a dozen drops on the brush when washing the teeth and gums. The more assiduously the patient assists us brushing his teeth, two or three times a day, using a soft brush and the mouth wash recommended, the more favourable will be the results of our treatment. Therefore, impress upon the patient, that your efforts will be without avail if he does not persevere in cleansing his teeth in the most thorough manner. The most important part of this treatment comes under the head of prophylaxis, for it is deficient care of the teeth and gums that is the chief cause of this local lesion which, once present, endangers every one of the teeth. In the case of young patients, who present deposits of concretion under the gums, make every effort to carefully remove them, twice a year, and persuade the patients to undertake the rational care of the

teeth and gums, which is so frequently neglected. Attention to the gums must be more strongly insisted on; without it we can expect no success whatever in our treatment of the disease under consideration. The advantage, however, which patients derive from carefully cleansing their teeth of concretions of tartar, is, as is generally believed, far greater; and the more the dentist directs his efforts in this direction, the more good will he do.

Dominion Dent. Jour.

CANCERUM ORIS.

By E. C. KINGSFORD, L.R.C.P. Lond., M.R.C.S.

DAVID C—, aged four years, was admitted to the Bolton Infirmary under the care of Mr. G. A. Patrick on Oct. 23rd, 1890, suffering from proptosis of the right eye and intense swelling of the cheek and eyelids on the same side. The child had been under treatment for three weeks with swelling of the right cheek and ulceration inside the mouth, with very free salivation. The former subsided somewhat after application of poultices, and six or seven days before admission increased again rapidly, the eyelids becoming involved. Teeth were extracted on Oct. 20th and 22nd. The boy was one of a family of three, and, according to his mother's statement, had always enjoyed excellent health; he had not suffered from measles or any debilitating disease, and came from a fairly healthy neighbourhood.

On admission the cheek and eyelids were hard, red, and swollen, and only a very small portion of the cornea, which was hazy, could be seen on separating the latter. Inside the mouth necrosed bone could be felt where the upper molars had been removed, and the breath was extremely fetid. The swelling did not extend down the neck or backwards, nor was there any otorrhœa. The child was not at all depressed, and did not seem to be in pain. Temperature 99. Chloroform was administered at once and the optic aperture enlarged by snipping through the outer canthus; this allowed of the escape of a small quantity of thin, stinking pus.

The eye was prominent, tension greatly increased, and the cornea quite hazy. The alveolar process of the superior maxilla was thoroughly necrosed, and its remains easily removed with dressing forceps. A finger then passed into the antrum came in contact with the eyeball, the floor of the orbit being partly necrosed away. It was now decided, seeing the hopeless appearance of the eye, to remove it, and this having been done, the remainder of the orbital floor was found to be quite bare; the lower orbital rim was then wrenched off with forceps, and a large-sized drainage-tube passed through into and out of the mouth, the two ends being united by a piece of thread. There was very little hæmorrhage during the operation, and the parts were freely dusted with iodoform and dressed with sal-alembroth gauze. The next day the child was quite cheerful and took his milk well, experiencing no difficulty in swallowing. Temperature 102°. Teeth quite clean, the cheek was still very swollen, and the eyelids had not diminished in size.—25th: Child quite lively and talkative, and insists on having his own way. There is a dark gangrenous patch at the outer canthus about the size of a split pea. Temperature 100°.—26th. Gangrene has started in the centre of the lower eyelid; there is copious salivation. The tube was removed, and the orbital cavity well swabbed with perchloride of mercury lotion (1 in 500) containing some glycerine, and lint soaked in the same used as a dressing. The gangrene now extended with frightful rapidity, notwithstanding that the parts were kept constantly soaked with lotion, and that the strength of this was increased to 1 in 250. The patient did not suffer any pain, and permitted the removal of sloughs, swabbing, &c., without resistance. He took his food well, and talked a great deal till Oct. 50th, when he became drowsy and very irritable. Temperature 102°. On October 31st, as the mercury was having no good effect, a lotion of chloride of zinc (eighty grains to the ounce) was used instead. The boy was now more irritable, and refused his food. He died on the evening of Nov. 1st. The whole of the right side of the face had disappeared, the cavity extending from just in front of the ear to beyond the bridge of the nose, and from the upper margin of the orbit to half an inch below the angle of the mouth, the commissure of the lips, however, being left intact; the upper eyelid was represented by a small central tag less than half an inch across. The floor of this cavity opened into the nose and

mouth. Most of the superior maxilla had disappeared, and the inferior was partially exposed.

Remarks.—As this case was not seen till three weeks after the onset of symptoms, it is difficult to determine how it originated—probably as an ulcerative stomatitis, followed by necrosis of the upper jaw, and typical nematous gangrene. No signs of the latter, however, were apparent till thirty-six hours after the operation. The mercurial treatment had no effect whatever in checking the disease, although in the three other cases in which I have tried it its effect has been most marked within twelve hours. This may be accounted for by the fact that the deeper structures were already thoroughly permeated by the virus, whatever it may be. I doubt if fuming nitric acid could have been adequately used, and am sure that the actual cauterization could not in this case, on account of the large surface of bare bone in the original cavity. The case is remarkable in that there had been no previous debilitating disease, and the boy was apparently in very good health. Constitutional symptoms, except rise of temperature, were absent till within thirty-six hours of death, when diarrhoea set in.

Lancet.

A READY METHOD OF REPAIRING THE METALLIC PORTION OF COMBINATION WORK.

The repair of the metal portion of attachment cases, or combination work, if the break is near the non-metallic portion, frequently entails the remaking of the case. An expert workman may strongly solder a break without injuring the work by protecting the teeth with wet plaster or by other expedients; sometimes, however, this is impossible, and we must choose between remaking, riveting, or the use of tinman's solder.

The following method of making such repair, where it can be used, may avoid the necessity of remaking. It is ready, quick, and gives satisfactory results.

After adjusting the broken portion of the denture, flask the case for vulcanizing, so doing it that the plate and teeth

will be in the same section of the flask, leaving in the other a cast of the palatal portion of the plate. So arrange that the sections of flask will separate readily without straining any portion of the plate, and also to permit its removal and accurate replacement.

The plaster having become hard, the flask may be opened. Sometimes, to avoid accident, it may be necessary to first make the flask and its contents sufficiently hot to slightly soften the rubber or celluloid attachment ; it is better, however, in other cases to open it cold. After the flask is open, apply to the plate the blow-pipe flame, or by other means heat sufficiently to release it from the attachment, and remove it. This should be done cautiously, so as not to destroy, any farther than necessary, the attachment, or, by using too great a force, bend the plate, injure the teeth, or the mold in the flask. We now have the plate free, and in the usual manner may make any desired repairs ; bearing in mind, however, to provide for its accurate replacement in the flask. To add to its thickness, a corresponding portion of plaster must be taken from the mold in the flask, so that the plate will again occupy its original position.

The repairs to the metallic portion of the denture having been completed, it is adjusted to that section of the flask having the cast of its palatal surface.

We now proceed, without changing its position, to cut away all portions of the attachment injured by the heat used in removing the plate, also removing sufficient to allow free space for the staples, pins, etc., on the plate, and to make such undercuts as may be necessary to securely unite the new to the old material. This having been done, we proceed to pack and vulcanize, making sure that the flask is entirely closed. When the case is finished, if proper care has been taken a narrow line of new material will be the only visible indication of the repair ; if a darker shade of rubber has been used, this will be hardly perceptible. The fit of the plate, the articulation and arrangement of the teeth, so often disturbed in remaking will be unchanged, while the time and labour has been but little more than that required for a similar repair of any ordinary vulcanite case.

In a similar manner, clasps may be added, or the denture extended, the desired additions being fitted and secured to the original portion before flasking.

Items of Interest.

FINISHING THE MARGINS OF TEETH.

By Dr. BLACK.

I want to say a few words in regard to polishing margins of cavities with disks. I will ask you to stop and think what rounding margins means. If we polish the margins with anything that is soft, with any form of polishing powder used on soft material, on wood, rubber, or what not, we will round the margin. Suppose I have a cavity in a central incisor. Instead of cutting this square with the surface of the enamel, it should be, a definite obtuse angle. If I polish it I round it over. It makes a nice thing to fill against: but when I make a section of that tooth, including the filling made against such an edge, I will find that at the margin there is a feathered edge of gold. You will form a feathered edge of gold over it if you round the marginal edge of your enamel. You should have in your mind the form which will be given to the marginal edge of your gold filling, and thin it out to a feather edge in any case, for in the formation of a nice rounded margin to fill against you form an edge to your gold filling that is unreliable. In forming your marginal edges take a good, sharp chisel and plane them so as to make an obtuse, but definite angle of your filling, getting a proper bevelled marginal edge of the enamel in every instance. It is just as important that the marginal edge of gold filling be right as the margin of the enamel itself. We must have them both right to get the best results. One of the difficulties in getting marginal edges of enamel in proper form is to prevent thinning out of the marginal edge of the filling material till it becomes unreliable. You should never polish the marginal edge of the enamel on which you are going to place a filling with pumice stone or paper disk unless it is in position in which you can so hold it to make a definite angle; then you need to be careful about it; never polish it with pumice carried by a stick or anything of this kind, but plane it with a good sharp chisel, holding its edge parallel with the marginal line of the cavity.

By the term marginal edge of the enamel I mean the cut edge of the enamel including its thickness. By the term enamel margin, I intend to convey the idea of the line forming the limits, or outline of the cavity. These two ideas should always be held distinct in the mind when discussing

the subject. We form the line of the enamel margin by cutting away till the proper form is given to the outline of the filling. We form the marginal edge of the enamel by planing it to the proper bevel and smoothing it.

With the mesial surface of a molar tooth, with the cavity reaching nearly to the gingival line, we have the line of the enamel margin of the cavity, and make a bevel to form the marginal edge of that line of enamel margin. The line of the enamel margin is important, and the forming of the proper bevel on the marginal edge of the enamel is also important. This form is so important that we should be careful to make it with reference to the form of the marginal edge of the filling, as well as the marginal edge of the enamel.

We do not want any square edges of enamel, they should be bevelled. We do not want an acute, or square corner.

When you form a cavity that is rounded and does not come close to the gingival line, the rule is you get recurrence of decay at this point, along which the buccal or lingual marginal line of the filling near the gum. Even though you have made a perfect filling you get recurrence of decay. You get it a good many times when you do not make a perfect filling. The contact point is here and the gum covering the proximate surfaces of the teeth comes up and reaches that point in young persons in a normal condition. The interproximate space is filled with soft tissue, and every portion of tooth tissue that is covered by the gum septum is protected against decay ; but in your operation you may have injured the gum septum, or it may have been injured in some other way so that it shrinks, and a considerable portion of the proximate surface of the tooth is exposed to the products of fermentation. Fermentation takes place between the two flat sides, hence we get a point of caries almost as soon as the shrinkage has taken place. Now, if you have prepared your cavity and rounded it here in the form of these cavities after simply removing the decay, and fill, the gum shrinks down. The part is exposed by the shrinkage of the gum, at the labial or lingual curves it approaches too near to contact to be self-cleaning, and we will get recurrence of decay. I find this recurrence on the incisors wherever there is a strong tendency to caries. Why ? Because shrinkage of the gum has exposed these points to the action of the products of fermentation. Cut your cavity out toward the labial and lingual, so that it will be protected by the gum for the

longest possible time. That is what I mean by extension for prevention. If you find corrosion of the surface of the enamel make the lines of the enamel margin include it, make extension further in the same direction to save the tooth from a recurrence of decay, extend the cavity around those angles as far as corrosion has occurred, then make a perfect filling, and it will be a long time before you have to fill that cavity again. It is better to do that in the first place than to remove the filling on account of recurrence of decay.

Dental Review.

CODE OF ETHICS, ARTICLES II., SECTION 3.

"It is unprofessional to resort to public advertisements, cards, handbills, posters, or signs calling attention to peculiar styles of work, lowness of prices, special modes of operating, or to claim superiority over neighbouring practitioners; to publish reports of cases or certificates in the public print; to go from house to house to solicit or perform operations; to circulate or recommend nostrums; or to perform any similar acts."

Bearing upon the maintenance of professional character among practising dentists, this section of the code adopted by the American Dental Association in 1866, ought to meet with the approval of all right-minded men. We confess, however, that we do not quite sympathize with the use that has been made of it, in its application to the few who have risen above the ordinary run of dentists, as inventors and discoverers. The late Dr. McQuillen, then editor of the *Cosmos*, opposed the code at the above convention, as "unnecessary for gentleman, and its enforcement impracticable among those who were not," and at a subsequent meeting of the Odontographic Society of Pennsylvania, a resolution was unanimously adopted, declining to accept it, upon the ground that it was an interference with the independence of local societies.

Circumstances may occur when it would, perhaps be wiser to relax its stringency. For instance, a dentist, after years

of investigation and the expenditure of thousand dollars, unaided in any way by confreres or societies, perfects or invents a boon to the profession and the public. While rivals, it may be, in the same town, are reaping the reward of selfish devotion to practice and money-making investments outside of dentistry, he has impoverished himself and his family while in his researches. He does not propose to monopolize his discovery. His practice has been seriously curtailed. He loses his patients while he is in his laboratory. To ask him to give away his discovery to men who neither helped nor appreciated him is unreasonable: it is uncharitable. A rival who invents a new mowing machine is perfectly "proper," though he may never contribute an idea or an implement to his profession. There are scores of petty "inventions" which have no merit, and whose authors cannot pretend to be placed side by side with a Barnum or a Land. But when a dentist devises or discovers something which is generally recognized as valuable, and, which his confreres are glad to obtain; when societies ask him and pay him to give clinics, and, in spite of arrogant sneer, he demonstrates its value, his effort merits open and fair encouragement. If the framers of the code intended it otherwise, why was a resolution offered in 1867, to give a prize of 5,000 dollars to any experimenter who produced a permanent white plastic filling? In 1870, at the Nashville meeting, Prof. Buckingham offered an amendment to the constitution as follows: "No person shall be a member of this Association who holds a dental patent, or is or shall be interested in one." The motion was lost. At the same meeting 1,000 was voted to the late Dr. Barnum for his discovery of the rubber dam. Dr. Barnum died poor. If we are to expect our discoverers to spend their lives and money for our profit, we must devise some better way of remunerating them than paltry testimonials and votes of thanks. The story of Dr. Barnum is not an isolated one. Some of the most critical and arrogant disparagers of patentees never did an unselfish thing for the profession. When an inventor is solicited and paid to exhibit his new ideas, he should at least not be treated like a malefactor, whose genius we are hungry to use, but whose "methods" may not square with our convictions. If poverty is to be even the chance reward of genius, codes of ethics are tyrannical. Members of societies who depart from the code, have no right to complain if they are forced to conform to them, or forced to retire.

But it seems to us, that an inventive genius merits some substantial reward for the labours of a lifetime. How shall we encourage this, and yet keep such men in our societies?

Edit. Dominion Dent. Jour.

CLINICS.

By EUGENE S. TALBOT.

It would be just as reasonable to turn a medical society into a clinic for the purpose of demonstrating the method of writing prescriptions, amputating limbs, and the like. I see no object in clinics except for the purpose of demonstrating something new, and this should be done in the local dental societies. If by the aid of clinics all dentists would discard unreasonable methods and adopt feasible ones, so that the method would be universal, then, I should heartily recommend the demonstration in all our societies; but this has never been accomplished, nor will dentistry ever be practiced upon fixed rules until the teachers in our schools assemble and formulate a fixed plan for the methods of teaching and demonstrating. There is no specialty in medicine in which this can be so well carried out as in the practice of dentistry, because, unlike other specialties, most of our operations are positive in character. The preparation of a cavity, treating and filling roots of teeth, applications to the teeth and gums, insertion of amalgam fillings, are the same as making waggon-wheels, sewing-machines, steam-engines, which are made in the same manner the world over. Occasionally an improvement is made in these machines, and in order that others may compete in the market with the new construction, they must adopt the identical method or improve upon it.

These demonstrations should be encouraged in local societies and post-graduate schools, for the purpose of inculcating the new ideas. They should be conducted in small classes, in such a manner that each member or student can make the demonstration under the supervision of the teacher, or it

should be so clearly demonstrated that all are perfectly familiar with it. The state, national, and international societies should be conducted in quite a different manner. Demonstrations should be entirely excluded from these bodies. They should be entirely scientific in their character. The time which is now devoted to clinics might be set aside for social intercourse and so relieve the mental strain, at the same time affording opportunity for becoming better acquainted with our confrères. For this purpose our national societies should always meet at one place, where arrangements should be made for permanent quarters. In connection with a hall there should be established reading-rooms and libraries, which should contain all the leading dental and medical journals. This room might also be used for social intercourse. A museum should also be connected with it, in which all the physiological, pathological, and anatomical specimens, models, and everything pertaining to dentistry might be deposited. All the cities in the united Kingdom, as well as other countries, have large collections of material which are of interest to dentists. It seems hardly possible that we in America, who have made such strides in dentistry, should not possess a museum which, while not equal to our advancement in operative dentistry, should be at least equal to many of the museums in Europe. A well-filled museum would alone be an attractive feature to the practitioners in the different parts of the country. It is possible that the national medical societies would club together with the dental and arrange such accommodations.

Cosmos.

ULCERATION OF THE MOUTH AS A SYMPTOM OF LEAD POISONING.

BY OSMUND STEDMAN, M.D. LOND.

I have thought it worth while to record a few notes on the this subject because it does not seem to be mentioned in the ordinary text-books as one of the symptoms of lead poisoning. My attention was first directed to ulceration of the mouth as

a symptom in this disease by a friend who had two cases in one family, both children, who each had a crop of small ulcers in the mouth, and on having the drinking water analysed it was found to contain a considerable trace of lead. He asked me if I know it to be a recognized symptom. My answer was that I had not heard of it. In April of this year I was called to see a child about two and a half years of age. He was feverish, temperature $100\cdot4^{\circ}$, and had six or eight small ulcers in his mouth which are best described as "phyctenular." They were situated on the inner sides of the teeth, and some further back, so that they did not appear to bear any relation to the teeth. The ulcers consisted of red excoriated spots varying in size from that of a pin's head to that of a hemp-seed, each surrounded by a small halo of whitish swollen mucous membrane. The child was constipated, and except the fever had no other symptom to note. The following day he vomited several times, and had frequent attacks of griping pain in the abdomen (colic), during which he screamed and drew up his legs. These symptoms, of course, clearly pointed to lead as the cause of the trouble, and on analysing the drinking water it was found to contain a considerable trace of lead, the source of the contamination being rain water stored in a lead-lined tank. There was no blue line present at any time, and on removing the cause of the trouble the patient rapidly got better, the treatment being directed to relieve the constipation by enemata, and the colic by small doses of opium. It would seem, therefore, that in cases of ulceration of the mouth in children one should look carefully for lead poisoning as a possible cause.

Lancet.

THE ALBERT METROPOLITAN UNIVERSITY.

The Lords of the Privy Council have given judgment *in re* the petition in favour of creating a new teaching university in London, with power to confer degrees, under the name of the Albert, or the Albert Metropolitan University. The judgment which was delivered by Lord Selbourne, was

practically a finding for the petitioners. The full details of the deliverance will be found in the metropolitan weekly medical press. We are, of course, quite unable to discuss the merits of the position at present taken up by the Royal Colleges and the Medical Schools in London ; but, in view of the finding of the Privy Council, these bodies seem to be placed in a dilemma. To us, in Scotland, it would seem unreasonable that the Royal Colleges should obtain the entire control of the Medical Faculty of the New University, and we are of opinion that the proposal of the Privy Council to grant the Colleges six and the Medical Schools five seats on the Council of the New University is eminently fair. In the event of the Royal Colleges declining the six seats offered to them, it is proposed to give ten seats to the Medical Schools, but if the *British Medical Schools* of 18th July last is to be believed, the Schools have decided to throw in their lot with the Colleges, who, as was stated by Sir Arthur Wilson, Q.C., would decline to accept the position which we cannot understand, and which, therefore we will not attempt to discuss.

A point of greater interest to us is the effect which the New University is likely to have upon medical teaching in Scotland. Large numbers of English students receive their medical training and degrees in Scotland, and there can be little doubt that, if a good teaching university, at which degrees could be obtained on the same footing as those granted by the Scottish Universities, was established in London, a serious diminution in the numbers of men who seek their professional education North of the Tweed would inevitably result. If the citizens of London are able to effect this, no one, and certainly no one in Scotland, can find any fault with them, and that this was the feeling of the Privy Council was demonstrated by their declaration that the Edinburgh University and the Scottish Medical Corporations had no *locus standi* in the matter in the present stage of the proceedings. It is not easy to estimate the effect that the new foundation is likely to have upon the numbers of students seeking the qualifications of the Scottish Corporation but, if a regulation to the effect that a qualification entitling to registration under the Medical Acts must be obtained before a degree in medicine can be conferred on a candidate by the New University is to stand in the charter," the numbers seeking Scottish degrees and qualifications are not likely to be seriously affected, at least for some time to come. We are

very far from believing, however, that it is the qualification alone which attracts English students to Scotland. The moderate cost at which a medical training can be obtained, and the excellence of the teaching, especially in the more purely scientific portions of the curriculum, are elements which cannot be neglected in judging of the success and attractiveness of our Schools; personally, we have no objection to the foundation of a teaching university in London, which, by stimulating a healthy competition and rivalry, would, we think, contribute still further to the success of medical teaching in the North.

Glasgow, Med. Journal.

PREPARATION OF A CAVITY FOR FILLING.—As human beings endowed with ordinary regard for the sufferings of our kind, we should carry out the operation with a view of in every way lessening the attendant discomfort. We should use sharp chisels in breaking down the walls of enamel. We should excavate with sharp, well-shaped instruments, cutting from the centre toward the circumference. We should use warm instead of cool or cold water in washing out the debris. We should use warm instead of cold applications as obtundants. We should use ligatures of silk, having previously used a cocaine solution upon the gums. We should use clamps adapted to the tooth. Arrange the instruments used in the dental engine so that those to be used on sensitive tooth structure shall be absolutely perfect, sharp and true, and a hand-piece that is free from defects. Sympathize with your patients in their suffering and meet any irritability on their part with a face free from resentment and as bright as a May morning.

—Dr. A. H. FULLER.

Ohio Journal.

Reports of Societies.

THE VICTORIA DENTAL HOSPITAL, MANCHESTER.

DISTRIBUTION OF PRIZES.

AT the invitation of the Dental Staff of the above hospital, a goodly company assembled in the Grand Hotel, Manchester, on the evening of Tuesday, July 28th, to witness the distribution of prizes to the successful students attending the dental school. The proceedings were a new departure, the previous prize distributions having been private and informal. The chair was occupied by Mr. H. Campion, and amongst those present were Mr. James Hardie, M.D., F.R.C.S., (who distributed the prizes,) Mr. Henry Planck (Dean of the Dental School), Mr. Tanner, Mr. G. Campion, Mr. Collett, Mr. R. Spencer, the Rev. D. Ellison, the Rev. G. B. McGovern, Mr. W. Headridge, Mr. Watt, Mr. P. Headridge, Mr. P. A. Linnell, Mr. F. W. Minshall, Mr. W. Dogan, Mr. C. H. Smale, Mr. W. A. Hooton, Mr. G. O. Whittaker, Mr. W. Simms, and Mr. T. North.

Letters of apology for absence were received from a number of gentlemen, including the Mayor of Manchester (Mr. Alderman J. Mark), Lord Egerton of Tallow, Sir W. Holdsworth, M.P., Mr. J. W. Maclure, M.P., the Bishop of Salford, Mr. Oliver Heywood, and Mr. S. L. Helm, (chairman of the managing committee.) The Mayor wrote:—"The institution is one of the many in Manchester that deserves the support and sympathy of all classes, and I know of none more likely to be of benefit to the public."

The Chairman having expressed his pleasure at seeing so many present, addressed himself to the students. He said some people objected to the giving of prizes, but his experience led him to think that rewards did a great deal of good, and he should be very sorry to see any diminution in their number at the Dental School. These competitions prepared them for the public diploma examinations in connection with the Royal College of Surgeons. The Staff of the Manchester Dental School ought to be very proud of the work of the past year, because all the students sent up to the last examination of the Royal College of Surgeons passed (hear, hear). Of

the total number who competed he was informed that 50 per cent. failed to satisfy the examiners. Their success was a pleasing testimony to the ability of the teaching staff, and to the way in which the students responded to their teaching, (applause).

The Dean supplementing these remarks, said all those who had competed, whether successfully or unsuccessfully, had learned habits of industry which would be of infinite value to them in after life. As to those who had not competed it was difficult to say anything very complimentary or very flattering. Some of them had said that they had not the chance or ability to compete, but although he was pleased with their modesty it was plain that in making these excuses they were only describing themselves in other words as comparatively idle men ; so that if he flattered them on the one hand because of their modesty, he was compelled on the other hand to admit that they were to some extent idle men. Still he thought he might say something encouraging with reference to them, and suggested that their conduct might have a sort of exemplification in the French proverb *se reculer pour mieux sauter*. In other words, they might be drawing themselves back this year, so that they could start forward full of fresh knowledge and carry all before them, (hear, hear.) The number of prizes given this year was fifteen. The committee had not thought it desirable to give one or two large prizes, as that would lead to only very few clever and industrious men competing, but their object being to stimulate all, they had divided them into a number of smaller ones, which gave every student a chance of success.

The prizes for dental surgery, mechanical surgery, dental anatomy, and operative dental dentistry were given by the lecturers of Owen's College who lectured on and taught those subjects. (Applause.)

Mr. James Hardie then gave an address. He said he should like to congratulate the students present upon having chosen such a very honourable and noble profession as that of dentist. He looked upon his own profession as the noblest of all, and the dental profession was simply a branch of it, (hear hear. Now-a-days dentists occupied a very different position in the world to that they occupied a very few years ago, before the passing of the Dental Act, 1878. At that time anybody could call himself a dentist, and the position of the profession in society could not be what it would be in a few years when

all had won their spurs by examination and been diplomaed. Of course, as diplomas were not then thought of, no reflection could be cast upon the gentlemen who filled the profession. But they must remember that it was the same with surgery long, long ago, when barbers and surgeons were mixed up in a jumble and practised surgery together (Laughter). He supposed that now quite a fourth of the practising dentists in the kingdom were diplomaed, which showed that a very large proportion had availed themselves of the Act and taken the necessary qualifications. He had been connected with the Victoria Dental Hospital since it was started, and he thought it had succeeded in a wonderful way. Although it had only been in existence six or seven years they had twenty students. He did not suppose there was a similar provincial school with so many. He heard with pleasure that they were raising a fund for the erection of a new hospital in a public thoroughfare, so that students would no longer have an inducement to go to London to learn their profession, but would be content to remain in Manchester, where they would be as well looked after as at any other school in the kingdom. One great reason why this was desirable was that the members of the profession would in consequence be more equally distributed throughout country, than if all were gathered to one central school in the London. The best men who were trained in Manchester, would no doubt remain in Manchester, instead of the lower stratum gravitating down into the provinces from London. In Edinburgh, for instance, where there was a very large medical school, the cream of the profession settled down and practised within the city and immediate neighbourhood. The same thing would happen in Manchester and the district (applause). Mr. Hardie then distributed the prizes, the recipients being as follows:

Mathieson Operating Prize:—J. V. Coogan and W. Fisher, equal.

Fletcher prizes:—David Headridge, F. L. Tanner, T. E. Sherratt and J. Butterworth.

Ash Prize:—F. L. Tanner.

Dental Surgery:—1. F. L. Tanner, and 2. J. C. Stokoe.

Mechanical Dentistry:—1. F. L. Tanner, 2. J. C. Stokoe.

Dental Anatomy:—1. F. L. Tanner, 2. J. C. Stokoe.

Operative Dental Surgery:—1. F. L. Tanner, 2. J. C. Stokoe.

Mr. Reuben Spencer, in moving a vote of thanks to Mr.

Hardie, said it was always gratifying to be present where there was to be encouragement of industry. He looked upon these occasions as great helps in the promotion of industry and thought, and enterprise on the part of young people (Hear, hear.) It seemed to him that if a young man chose the dental profession as his department of labour it did not indicate either idleness of purpose or inclination, nor could he think that it would lead to idleness in after life. On the contrary, it would certainly lead to giving of a great deal of relief to humanity at large. He could not help being reminded of the remark of a statesman in America, to the effect that Edison never let the floor get cool beneath him, but kept it warm by constant walking. He always found that honest men, especially young men, admired energy, courage, pluck and capacity, and so it would be at the Manchester Dental School. As a trustee of the institution he had its interests at heart. The day was not far distant when they would have more commodious and more suitable rooms, and he hoped that in the future the hospital would take its stand as one of the first and foremost in the provinces, and be a real blessing to the poor people of Manchester, (Applause.)

The Rev. D. Ellison seconded. He said dentistry was of almost universal service in this country, and the practice of it should be very highly commended. He had very great sympathy with the remark of the Yorkshire boy who said he liked toothache, and gave as his reason why that it was "so nice when it 'ed gen ower" (Laughter.) Dentistry had very much to do with bringing about that very pleasant feeling, therefore he endorsed the opinion expressed that next to the medical profession they were all very much indebted to it, (Applause).

The resolution having been cordially adopted, Mr. Hardie replied.

The Rev. J. McGOVERN moved a vote of thanks to the Chairman. He said his duty was especially pleasant because some years ago it was his pleasure to belong to the staff of the Hospital. He had watched with great interest the progress it had made since then, and he hoped that at a not far distant time they would see a structure worthy of the talents of the students standing in their midst. He was sure the public of Manchester, so liberal and philanthropic as it was, would not object to emptying its pockets a little in this matter. (Applause.)

Mr. W. Hooton Seconded.

He said he knew it was the Chairman's earnest desire that their hospital and school should be thoroughly complete in every respect (Hear, hear.)

The motion having been carried, The Chairman replied.

He said he took very great interest in the welfare of the institution. Theirs he considered to be one of the most useful professions in the world; by its proper exercise they could do as much good by suffering humanity as by the exercise of any other known calling (Hear, hear.) Of course all depended upon how the work was done. A man might debase his profession by making it simply a money making business. He did not call a man of that kind a professional man. A professional man should first of all consider the wants of the unfortunate person who came to consult him, and his first question to himself should be "Can I relieve a fellow creature who is suffering"? He did not hesitate to say that if a man honestly and conscientiously acted in that way, although he might at times go without a fee, he would in the long run meet with adequate remuneration for all he had done, if not in a pecuniary way in the far more gratifying one of knowing that he had done his very best for his fellow men. As to the new hospital they could not press the project upon the people of Manchester too strongly. It was absolutely necessary they should have a new building, and that without any delay, if the hospital and school were to continue together and progress in the future as they had done in the past. They had to compete now with schools and hospitals, that were fitted up in the most perfect manner with all modern scientific apparatus, hence if they were to maintain a good dental school in Manchester they must have all the best appliances. He was quite sure if they only got the buildings, appliances would be forthcoming (hear, hear). He hoped they would erect a building in a good locality, so that they could show the public they were doing something (applause).

This terminated the proceedings.

MANCHESTER ODONTOLOGICAL SOCIETY.

The first Annual Picnic of the above Society, took place on Saturday, September 12th, 1891. The members and their friends, (among whom were many ladies), to the number of

about 50, journeyed by special saloon carriage to Bakewell, in Derbyshire, where a most enjoyable afternoon was spent under conditions of weather, the most delightful.

Under the guidance of Mr. A. E. Cokayne, a local antiquarian of repute, the members visited Haddon Hall, and later on Bakewell Church, both objects of surpassing interest, and rich in memorials of the long past. At the Rutland Arms, ample justice was done to the substantial tea provided to satisfy the material wants of the members. At the conclusion of this part of the proceedings, eloquent testimony was given to the manner in which the committee, (Messrs. Renshaw, Collett and Headridge), had made the arrangement for the comfort and enjoyment of the members and their friends, and the President, Mr. I. Renshaw, expressed satisfaction at the inclusion of ladies in the Picnic; whose presence was in harmony with a day full of sunshine, and whose company had robbed even a railway journey of its monotony. Finally cordial thanks were given to Mr. Cokayne for his welcome guidance in the visit to Haddon Hall.

Dental News.

THE COMMITTEE OF THE HOUSE OF ASSEMBLY, CAPE COLONY, ON THE DENTAL CLAUSES OF THE MEDICAL BILL.

THE House went into committee on this Bill.

On clauses 6, Council to consist of seven medical practitioners and one dentist.

Dr. SMUTS said that the medical practitioners had expressed very strong opinions on this clause. It was proverbial that doctors differed, but on this clause all the doctors were agreed. He moved an amendment to the effect that the Council should consist of eight medical men instead, that five medical representatives should be elected by medical men, and expunge the words relating to dentists from the clause. He said the doctors bore no ill-will to the dentists, and would have no objection to one surgeon whose speciality was dentistry sitting on the Council to represent the dentists. He hoped the House would accept the amendment.

Mr. O'REILLY hoped the government would not accept the amendment, and expected to see the Colonial Secretary

refuse to allow the Bill to be altered in this way. In the interests of the public it would be unwise to agree to the amendment. If the Council were formed without a dentist being among included in it he believed it would be a failure, and that dental diseases would not be considered as they ought to be. He would bet his life to a pen'orth of gooseberries, if he were allowed to, that the hon. gentlemen who moved in this matter could not stop his (Mr. O'Reilly's) tooth. He hoped the government would stick to their guns, and not allow the measure to be mutilated. The dentist would have no power to vote on medical questions.

Mr. SAUER said that last year a Select Committee reported in favour of the board being constituted as purposed by the Bill. He was of opinion that it would not interfere with the usefulness of the Bill if a dentist did not sit on the Board. It had been said that it was invidious to allow a dentist to sit on the Board without having a vote on practically all the questions that came before the Board. Still, the Select Committee had recommended that a dentist should sit on the Board ; therefore the proposal was made. The medical men, as he understood, had not the slightest objection to a qualified surgeon dentist sitting on the Council. There was a good dead of force in the objection that a representatives dentist should not be permitted to vote on purely medical questions. (Hear, hear.) All over the Colony medical men practised dentistry as well as medicine, and he really had no strong feeling on the matter either way.

Mr. JONES hoped the clause would pass as printed, and urged that the medical man could not be expected to have such a knowledge of dentistry as a qualified dentist of whom there were three, eminent men in their profession, in the Colony. It would be a great advantage to have such a man on the Council.

Mr. WIENER cordially supported the clause as it stood, and hoped the amendment would be withdrawn.

Col. SMBCHERRUCKER could have understood the strengthening of the Council if it were proposed that one of the members should be a fully qualified surgeon, who practised in the Colony. (Dr. Smuts : I will do so.) Then he could not understand the amendment.

Dr. SMUTS observed that any loafer could be registered as a dentist. No qualification was necessary. There were no

qualified dentists in the Colony. (Sir. G. Sprigg ; What?) As least no surgeon dentists.

Sir G. SPRIGG could not compliment the hon. gentleman (Dr. Smuts) on his procedure. The hon. gentleman had said that anyone could set himself up as a dentist and draw teeth. (Hear, hear.) Then Heaven preserve the patients. Surely it was necessary to have a fully qualified dentist on the Council.

Mr. INNES pointed out that there were a number of well-qualified dentists in the Colony, and the Government might be left to choose a proper man.

Mr. FULLER hoped the recommendations of the committee which set on the matter would be agreed to.

Dr. SMUTS said no such arrangement existed in any other part of the world, and why should the Colony go out of its way in the matter.

Mr. FULLER said the reason was obvious. In other countries proper Dental Boards existed. This Colony could not at present incur that expense, and a mixed Board would do very well for the present.

The first amendment was negatived, whereupon Dr. Smuts withdrew the remaining amendment.

On clause 11, voting of dentist member.

Dr. SMUTS moved an amendment to the effect that the dentist member should not be allowed to attend meetings of Council, except at meetings where by resolution of the majority, dental questions were under consideration, and at the meetings for the election of president.

Mr. SAUER advised the withdrawal of the amendment. (Hear, hear.) He was afraid the Council would never summon the dentist if the amendment were agreed to.

Mr. O'REILLY hoped the hon. gentleman would be satisfied that the House was against him, and withdraw the amendment.

Sir G. SPRIGG said that inferentially the clause laid it down that the dentist could not be president of the Council, but that he had the satisfaction of voting for another member.

Mr. SAUER said it would not be fitting that a dentist should be president of the Council.

Mr. TAMPLIN moved that no dentist should be a member of the Council unless he were a qualified medical practitioner as well. He knew that throughout the country there were dentists more or less qualified, but it was desirable to improve the qualifications of practising dentists.

Mr. SAUER said the committee had decided that question already. If the amendment were passed it would mean that there would be no dentist on the Council.

Dr. SMUTS withdrew his amendment, and that of the hon. member for Victoria East was agreed to, and the clause was passed as amended.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

To the "Editor of the British Journal of Dental Science."

SIR.—Enclosed you will find a cutting from the "Cape Times" of to-day's date, containing a report of the proceedings of the Committee of the House of Assembly on the new Medical Bill, which may prove of interest to your readers. In spite of the strong opposition of the Cape Town Medicos, we have succeeded in getting one dentist on the Medical Council, which will for the future have sole right of granting licences to practise dentistry in the colony. Hitherto it has been open to all comers. Provision is made in the Bill for registration of all those who were in actual practice on June 15th last, and who have paid the Government license of £2 10 0. The presence of a practising dentist on the Council will tend to prevent the registration of persons not actually in practice, chemists' assistants, &c., and cannot but help to raise the profession here in the eyes of the public.

I am, Sir, Yours, &c.,

JOHN P. GREY-CUNNINGHAM.

APPOINTMENT

Dr. J. Cowan Woodburn to be Honorary Consulting Dental Surgeon to the Glasgow Royal Infirmary.

VACANCY.

West Kent General Hospital, Maidstone. The post of Honorary Dental Surgeon is vacant. Applications to be made to the Secretary.

British Journal of Dental Science.

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THE DUAL QUALIFICATION.*

By C. H. BUCKLEY, M.R.C.S., L.R.C.P., L.D.S., Eng.

I cannot address you this evening without asking for your indulgence and apologising for my presumption in dealing with this subject, but bearing in mind how very important it has become, I think I am fully justified in bringing it under your notice. Furthermore, I do not remember any reference to it being made at any of our meetings. You will agree with me it is a very difficult question ; very few men seem to think alike, and for some one, so young a member of Dental Profession, to deal with this, is—to say the least—amusing. In order to understand everything, we must commence at the first chapter. Assuming that a Student has registered as a Dental and as a Medical Student, which it is just as well, we may proceed to consider the subjects which a “Pure Dentist” is bound to take up.

First comes Anatomy and Physiology, which is so very essential to the aspirant for Dental honours. It is the A.B.C. of Surgery and Medicine. Then Surgery and Medicine ; Dental Anatomy and Physiology. Dental Mechanics ; Dental Surgery ; Metallurgy ; Materia Medica ; Chemistry ; These are the subjects of the “curriculum.” A little General Hospital work and 2 years Special Hospital work is all that is necessary. Let us pause for a moment and look again at this list of subjects. We have Surgery, Anatomy, Physiology, Medicine, Materia Medica, Chemistry, Practical Anatomy, all these are subjects required for the examinations in Surgery or Medicine. A few more extra subjects—and there you all are complete and signed up—as regards College work, for a

* Read before the Students' Society of Victoria Dental Hospital, Manchester.

Surgical qualification. These subjects then are common property for the Dental and Medical Students. Therefore, the result is that we cannot draw a hard and fast line between Dental Education and Medical Education as far as that education is concerned. Of course that line is very often better painted and made more plain by Dental Students than it ought to be. I remember reading a paper by an eminent London dentist on this subject, and he could not see where one begins or the other ended. I say, at present we can see where one begins, etc.

Now the question arises, is it proper, is it the right thing, is it sensible to assume that the two professions are practically one, because such a foggy line exists between them? I say it is not right, it is working on that principal of "a little knowledge is a dangerous thing." What then must we do? Only one thing,—remove that foggy line, erase it, make the two professions into one, and let the dentist and surgeon, for such he would be if surgically qualified, take up dentistry as a speciality. The tendency of the age is to reform. No matter where you go, where you look, everyone is trying to beat his neighbour, and what requires reform better than our profession? Have we as a body of professional men raised ourselves in the eyes of the world as the other professions have? No, not yet, but we are doing it. Why? Because we are keeping together, have meetings, converse, exchange ideas, and last, but not least, teach one another. That is where the secret lies, and as time rolls on, each and everyone will seek knowledge to keep up with the times. But any body of men will raise themselves, professionally, by these means, but how must we do so in the public eyes? By reform. And what is the nature of this reform? The answer to that is practically the subject of our paper. Make ourselves, each and everyone a true member of the medical profession, and work with might and main, at dentistry and its sister subjects.

The Act of 1878 was a step in this direction, previously it was only necessary to have some rude education, but we must not be content with this, we must push on and on, and let our cry be "Excelsior."

The Act 1878 was only the foundation on which we, as future dental practitioners, must build our dignity and name. I have just said we are raising our profession, let me show you how we, or rather they, have done so before.

Did a student require to know as much forty years ago as

he does now? That requires no answer. There are men here who know, as well as I do, they did not. Did they require Anatomy, Physiology, and all their other "ologies"? No, they did not. Why? Because as science advances, as men grow older they wish to know more. Now my argument is this:—If years ago the heads of the profession saw it was wise to enforce these subjects, what must it be now, at a time when each man must know something if he wishes to push to the front? It was the same with the Medical Profession, (I use the term in its broadest sense.) If a man could set a limb he was clever, he was a surgeon, but now almost any sensible man knows how to do it. Medical students now must know more than the doctor of more than fifty or a hundred years ago. So with dentistry.

At present a wide-spread notion exists that there is a true distinction between our Dental profession and the Medical profession. No doubt you agree with me when I say there is none, except in kind of knowledge. Who is here present to-night who would object to being on the same platform, who would object to place our profession on a level with the surgical profession? Is it not desirable that the two professions should be one? It would be the greatest triumph the dental profession has ever achieved, to cement even more strongly and maintain that union, which is so desirable. To obtain this there is only one way, to take in addition to your L.D.S., a surgical qualification as M.R.C.S., L.R.C.P., M.B., B.S., etc. Most dentists seem to hold themselves aloof, and think that it would do harm to join the sister profession. We are in the habit of saying "The Dental Profession," as though we were distinct from the other, but my opinion is that we are a kind of hanging on, tail-like profession, neither distinct and definite, nor associated with anything else except quackery.

I fancy I can hear you say, "Of course we are a profession, we have nothing to do with surgery, and the surgeon nothing to do with us." Never was a greater mistake made; we have a great deal to do with each other, and more the reason, if we have not, that we should have. It is a common thing to say that the surgeon knows nothing about dental matters. Quite right, he does not. He does not pretend to know, but as a rule he knows more about malformations of oral contents than the ordinary dentist, a thing which in these days should not exist, and which I feel certain in time to come will not exist.

If a man has two qualifications, he has the knowledge of a surgeon, which is now no light knowledge, added to that of dentist. How many men with all their dental education have failed to diagnose the various forms of malignant affections of tongue, gum palate, &c., to the utter ruin of patients. I could cite a few cases which have come under my own knowledge within the last eighteen months.

A case comes—ulcerated gums, tongue, &c. A man whose knowledge of general matter is nil, says, with all the pomp and pride of an ignoramus, "Oh! ah! yes, wash your mouth with this lotion and you will soon be all right?" Then how does he know but what it might be some malignant affection. Don't misunderstand me, I do not mean to say everyone is so ignorant, but allow me to say the majority are, unless the disease has so far advanced as to be unmistakable by any one but a lunatic. I recently heard of a case which came under the notice of the House Surgeon of the National Dental Hospital. Briefly it is as follows:—A man presents himself at the Hospital, suffering from some affection of the gums. On Mr. Lankester examining him, he very quickly found an Epitheliomatous growth involving the gum, tongue and lower jaw. He, on enquiring why he had not come before, was told that he had been to a Dentist, who when it was smaller, had fitted a denture over it to push it away. The case was immediately sent to a General Hospital, but it was too far gone for operating. Where was that fellow's—I cannot say dentist's—knowledge? If I mistake not, he was an L.D.S. Where could he have got it without surgery? Perhaps he had never seen an epithelioma, and could not diagnose it. If so, he was nothing less than an imposter, a charlatan, a quack whose little knowledge was a dangerous thing. It might be argued, if he never saw one, he cannot tell one, he cannot diagnose it. But you can; you can do so by extending your general knowledge of tumours and surgery proper and not fall into such a pitfall. By taking a longer course of Hospital Practice, you would see more of these affections. I doubt if I were to ask any student present how many malign affections of the oral cavity he has seen, I think he would astonish you with the very small number. In these days of advancement, such will not hold good long; the time will come when more work, more knowledge will be demanded of the dental student. He must be well up in general work before taking a speciality; a child must know the A.B.C. well before he or she can read fluently. In the Medical and Sur-

gical professions, we have Aural Surgeons, Ophthalmologists, Gynæcologists, &c., and many other specialities. Why on earth should dentistry be placed in the middle of a field by itself? A specialist on the Ear or Eye cannot successfully treat the various diseases of those special organs of sense, without having a thorough foundation in general surgery and medicine, though Chopart's Amputation of foot, or ingrowing nail has nothing at all to do with it. You will admit how very common it is to meet with various reflex actions due to disease of the teeth, and you cannot treat those diseases without you have some definite knowledge as to their pathology, and which is certainly not a part of the Dental Student's Examination. I think you will see how essential such knowledge is. If you work it up then, you are in one way working for your M.R.C.S. &c. and once within bounds, wouldn't you have a try for a second diploma? It has no more to do with the better extraction of teeth, or insertion of a filling, than the ingrowing toenail has to do with enucleation of the eyeball, but for all that the ophthalmic surgeon must know everything before he starts his special line of practice. It will not make Benjamin Robinson a better gold filler—20 diplomas will not do so, but as one diploma, viz : the L.D.S. raised the dignity and status of the profession a step ; I hold and argue that two diplomas will raise the dental profession, another step and on a level with your neighbour, Dr. Brown.

Again, it will be a means of doing away with that mean drudgery work which even some legally-qualified men are apt to do. It will make the medical profession meet us with a "Good-morning" instead of the nod and rush past which is now the rule. If you are a duly qualified surgeon in addition, does it not follow your former students (medical) will look upon you not as a tooth-puller but as a Surgeon with special knowledge of the Dental Art. The possessors of such diplomas are looked upon by the community; as well as by their colleagues, as men who really show they have mastered principles and practice of the various branches of his profession. He takes a higher standing just as an F.R.C.S. does in the Surgical. He won't be a worse operator, and the chances are he will be a better dentist, because Dentistry is not all Gold filling.

Do we not all admire Sir John Tomes, Sir Edmund Saunders, Chas. Tomes, Smith Turner, and a host more. Are they not the leading lights of our profession, do they seem to have

lost anything by having a dual qualification. Of course there are men, who have only one qualification, who are quite as good dentists, but it proves that the possession does no harm. It is urged then why the extra work when one can get on without them? Did not our father get on without them—without anything—would they do so now against the competition? My experience is that men who talk in that strain are men who are selfish of his neighbours being above him and in some cases are the very men who, when chance offered itself, betook themselves with rapid strides to Dublin and Glasgow to obtain the much coveted L.D.S. Why do these men want a diploma? To look big, to rival his neighbour, to deceive themselves, that they know about everything and anything. They take it to give themselves a better local standing. The title certainly does not make the man, but it stamps him as an educated man, whether the principles and practice are faithfully applied depends on the holder and not the diploma.

Let us examine and see if there is any tendency for the two professions to become united and really one. The older dental surgeons will perhaps remember when a doctor looked upon a dentist as a simple tooth drawer and maker of artificial teeth, although their knowledge of dentistry was very vague as compared to the average dentist of to-day, I say, a man who extracted teeth was looked upon as a very good man by the public, but not so by the surgeon. What is their relation to-day? Need I repeat to you how the surgeon attends the same meetings, is a member, reads papers, explains various cases, and in fact tries to make himself socially agreeable. For proof consider how many surgeons are members of the Odontological Society of Great Britain. The men are straining every nerve to unite the two professions, some of them are qualified in dentistry. Again, are we not licentiates of the same College as the Surgeon. The gulf between the two is there, but it will be bridged over in time and eventually filled up. We are specialists in our subject, but then if we do not in some way become distinct members of the medical profession, we shall not make that headway which is so essential. I hear it said often that dentists do not like the idea of a surgeon giving anæsthetics in dental hospitals. They argue that the want of knowledge of a surgeon to give gas is sufficient to cause this removal. What is the remedy: Why, simply qualify in Surgery and Medicine, and then you will have special know-

ledge how to administer gas, and also chloroform, for how many dentists would feel safe in administering CHCl_3 for half hour or quarter hour. I say distinctly, that unless a man has had practice and studied it, he cannot feel safe in administering CHCl_3 . Accidents are sure to occur with the best men, but do not the public feel safer when they know "the doctor" is at hand. One dentist told me that he liked a medical man when an anæsthetic was given, for he felt the responsibility lifted from his shoulders. I am afraid many would feel the same if they attempted anything but administering gas. Are not these facts in favour of a dual qualification? You see there is much to gain, nothing to lose.

A Manchester Surgeon asked me one day, why some Dental Surgeons did not go in for operations about the mouth. He said you are used to operating in a confined space, and I am sure with a little practice you would have success. I do not, for one moment, mean that every dentist should do this, but I think they might be done in Dental Hospitals by surgically qualified dental members. What amount of surgery, general and special, does the old dentist know? Practically none. Theoretically less. Now we must know a little about it, we are supposed to know all about the laws which govern health and their relation to diseases of various kinds, the many departures into pathology, and the laws by which they are governed. These are fundamental principles which must be thoroughly understood if we mean to benefit and become learned men of our profession, but how can we without entering into the subjects of surgery, medicine and pathology. There is no such division from these subjects as our L.D.S. Examinations, would make us believe. Nearly all our scientific work is done by men who have got an additional qualification. Men with only the L.D.S. have not that ground work and necessary foundation, unless they studied it specially, and in that case it is as easy to take your second diploma. No man, be he a surgeon dentist, gynecologist, can afford to fall short of the high standard of knowledge now necessary. Unless he has that knowledge, he builds up his practice, not upon his knowledge or skill, but on the credulity of his patients. I say take M.R.C.S. &c., first, then strike out your line, if it be dental, then go in for the L.D.S. just as a surgeon who wishes to take up surgery takes an F.R.C.S. To pretend that the dual qualification is useless is utter nonsense. I think everyone here would be proud to have it.

I strongly urge all men who have money and time to go in for the two qualifications, and mark the words, the time will come when it will be necessary. I should like to have mentioned one or two other matters, but time is short and I will some day resume the subject and form another view. I thank you gentlemen for the attention you have paid me.

TWO CASES OF PARALYSIS, DUE TO DISEASED TEETH.

By W. R. TUCK, of Truro.

For a considerable time I attended a gentleman professionally, who resided near Bristol. On one occasion, while he was sitting in my operating-chair, he began to tell me of an affliction that had befallen his daughter, and which had prevented her from seeing me as previously arranged. This young lady was about twenty-three years of age, when by some unaccountable misfortune she was seized with an affection of the knee-joint; in spite of medical treatment, the pain and symptoms became gradually intensified, to such an extent, that she was unable to walk across the room without the aid of crutches. The best advice had been sought in vain; blistering and leeching had been resorted to. I ventured to suggest that it might possibly be the result of diseased teeth, the gentleman, thinking that his remarks on the case had been misunderstood, emphatically reiterated "Listen again, it is all in the knee." On my repeating that nevertheless it might all have arisen from dental disease, my hearer seemed greatly bewildered, and verily thought that I was *non compos mentis*; seeing this, I produced a volume of Dr. Bell's and read from it a paragraph referring to himself, in which he states, that he suffered for fourteen years from a neuralgic attack in his heel and had rung the changes on all the pharmaceutical remedies applicable to his case with little or no benefit. One morning, however, after breakfast, on using a tooth-pick, he started an attack of pain similar to that which had so long distressed him. He immediately made up his mind to have this

tooth removed, the result being that he had no further suffering afterwards.

Knowing something of the family of the lady in question, I concluded that, although young, she probably had a similar fatality in these organs to that of her parentage, and advised that her teeth should be thoroughly attended to. This advice was acted upon with the best results, and I am happy to say that in a few weeks, she had quite recovered from her lameness.

The foregoing is intended chiefly as a prelude to another remarkable case which was sent to me through the above successful source.

The little family of whom I am writing, were members of a church situated near their residence, and on visiting terms with the incumbent. He, therefore, knew the history of the case just related, and, as it happened, some little time afterwards, he, himself was seized with paralysis in the extremities, which would come on from any exciting cause, mental or physical, wherever he might be, or however employed. Whenever attacked, he was compelled to drop down and wait for the fit to subside, which would last probably thirty minutes. This gentleman being impressed with the success following upon my former advice to the lady, thought that I might possibly be able to trace the mysterious agency in his case to a remote cause. He stepped into my consulting room one morning quite unexpectedly, having travelled two hundred miles to see me, and asked me if I would be good enough to examine his mouth. In doing so, I was greatly astonished to find not a single vestige of disease, and asked him why he had come so long a distance for consultation. In reply he stated that his knowledge of the former remarkable case had induced him to come so far west for advice. In describing his symptoms, he said that, concurrently with the first attack, he became intolerant of certain sounds, indeed, there was such an exalted sensitiveness of the whole nervous system, that, to use his own words, "I have been eating my meals for the past four months in perfect dread of scratching the plate with the knife or fork, even the buzzing of a fly in the room, or the sound of the harmonium are all so inimical to me, that either of them would arouse the mysterious agony, I have been describing, and completely prostrate me." He also brought with him a number of prescriptions for me to see, obtained from several eminent doctors, I noticed from

their nature that they all agreed in one thing, namely, that there was want of tone; their remedies, however, failed to impart the needful tonic. I saw, the moment he entered my room, that he was of a highly nervous and excitable temperament, I therefore deferred any further diagnosis until the next morning, recommending him in the meantime to take 20 grains of the bromide of potassium. The following day he came and informed me that he had had a comparatively quiet night, but still felt the same screwing sensation on the nerves, I proceeded with my examination by percussion, and on examining all the upper teeth in succession, found the right upper second bicuspid dull and without tone, that manifestation of disease somewhat relieved my mind, for I was utterly at a loss how to account for the remarkable phenomenon, and being quite occult, I was unable to give a decided opinion as to the nature of it. After much thought and consideration I decided on removing the suspicious tooth, and was much gratified to find the nature of the disease as I had anticipated.

The morbid appearances were as follows:—Exostosis, largely developed, the apex of the tooth much inflamed, involving the nervous and arterial communication at the foramen. Dividing the root, the nervous tissue was found to be much calcified, this condition or state of things must have evidently affected the higher nerve centres, which seemed to have exerted the neurotic influence and induced the paralysis mentioned. With simple treatment this gentleman soon recovered his wonted health, and was able to resume his clerical duties which he had been compelled to resign for some months.

TWO CASES OF RETARDED ERUPTION OR SUPERNUMERIES?

By JAMES HARDIE, Melbourne.

CASE I.—A short time ago I was consulted by a gentleman about sixty years of age, regarding the very loose condition of an entire upper denture, which he had worn with comfort for some years. On examining the mouth I found on the left anterior ridge of the upper jaw a swelling with small

white specks in its centre, about the position where the canine should be. Taking a probe and pushing aside the gum I found it was a tooth in process of eruption. On being informed of this the patient desired me to remove it at once, which I did, and it turned out to be a fully developed canine. I told the patient it might be followed by the corresponding tooth on the right, and in about two months after he returned and had the right canine removed.

CASE II.—A lady, forty years of age called and asked me to repair her case, a vulcanite upper with central and lateral incisor broken off. As teeth and case both were strong, I said to her that great force must have been employed to fracture it. This she denied and requested me to extract the root of the central incisor. On examining it I found as in the previous case considerable swelling of the gum, with the same white speck in the centre. On pressing aside the gum, the so-called root proved to be a new tooth, she has decided to allow it to remain, and I await the sequel with interest.

REMOVAL OF PULP WITH COCAINE.

By Chas. C. PATTEN.

Doubtless every practitioner has experienced unpleasant results and delay in attempting to devitalize pulp with preparations of arsenical paste. To all those who have not yet given it a trial, I would recommend in the place of arsenious acid a twenty per cent solution of muriate of cocaine. Have it prepared in small quantities, as it is more reliable when fresh. I have successfully removed the pulp with a four per cent. solution, but less time is required if a stronger one is used and twenty per cent. seems to answer very well. Apply the rubber dam, and cleanse the cavity as well as possible without causing pain. Saturate with the solution on a pellet of cotton and after a few minutes carefully and thoroughly expose the pulp. More cocaine is applied, and with care it may be worked down the canal with a broach till the apex is reached without much pain. The pulp can then be painlessly twisted out with a broach on which are wound a few fibres of cotton, canals dried with hot air, filled with chlora-percha, and the operation completed at one sitting.

Items of Interest.

British Journal of Dental Science.

LONDON, OCTOBER 15th, 1891.

APPOINTMENTS.

AMONG the many difficulties with which we have to contend in our every-day work, there is none greater than that of so arranging out time that the work required by one patient need not be hurried, in order that a second shall not be kept waiting. Practices may be said to be conducted on one or two different principles. The one, for lack of a better name, we will call the "Casual Principle," where patients come without previously making an appointment, and take their chance of being seen or having to wait ; and the second may be named the "Appointment Principle," when previous to the visit a definite appointment is made. To those who have had any experience at all of these two different methods of working a practice, the immense advantages of the appointment system will, we are sure, be at once apparent. Not only is it of such advantage to the practitioners in allowing him so to arrange their day that he may have some degree of regularity in the amount of work he is called upon to perform, but it is quite as great a boon to the patients in that not only are they sure of being seen when they come, but they also stand a much greater chance of having that which is done, done well. Great as is the advantage of this appointment system, it is, however, no exception to the rule that it also has its faults. The chief of these is, perhaps, the difficulty of guaging the time required by each patient. Say that an hour is reserved under the impression that a

fairly large gold plug is required, and then, from various reasons we find an osteoplastic filling is indicated, we may be left with half an hour on our hands, in which we could easily have seen a second patient, whose visit we have been obliged to postpone. We are quite prepared to grant that this is a great disadvantage, but certainly not so great as to outweigh the gains, and it can, indeed, be somewhat met by only giving a short appointment unless we are quite sure a longer is required. We are well aware that some practices are conducted on the half-hour or guinea principle. No appointment of longer than half an hour is given, and no greater fee than a guinea is taken, consequently no work which cannot be completed in half an hour is undertaken. Now we are also quite aware that some people can do in half an hour what others would scarcely complete in two or three half hours, but we are equally sure that those, who adopt this method, do a great deal of scamped work, which they would be heartily ashamed of should it come under the ken of their brother practitioners. They will tell you they cannot help it, they have a number of patients to see and they cannot afford to give longer to each. This plea is perhaps valid in low fee practices, when the practitioner must see a goodly number of people in order to earn a competency, but the pity of it is that it also, to a great extent, finds favour with some of those who have the more wealthy patients. These men talk as if the world would come to an end, should they not see every patient who wishes to see them, they grub and scamp along, fill over exposed nerves, leave dead nerves unextracted, put in fillings to last for weeks, instead of for years, and, perhaps, finish up the day by actually running down these very things, their own methods, when they find themselves at a Society meeting in the evening. We know very well the difficulty of working to appointment, and if appointments are made, they must, of course, be kept, but we also know that if these men would set their faces sternly against scamping work, would charge a fee according to the time the work had taken, and, moreover, take the time to do

it, even though it might involve sending some patients on to a less busy practitioner ; we say, we know that the result would be no pecuniary loss to them, and would certainly tend to check a good many stories which are current in dental circles concerning their failures. The public are now sufficiently awake to the need of attention to their teeth, and are willing to pay for more careful work, if the practitioner will do such. It is not merely a personal question, solely between these guinea men and their patients, it affects the profession at large. If a leader in our ranks will only take half an hour and scamp his work in order to do it, how can a practitioner who is desirous of doing better work, make the patient understand why it is he takes longer, and why he, therefore, must ask a higher fee.

In our recent issue, it was our painful duty to chronicle the death of a boy, who killed himself by an overdose of chloroform taken to relieve toothache. To-day we have to record the death of a medical man, Dr. Eustace Bright, of Bournemouth, through an overdose of cocaine taken with a similar object. Surely this is very melancholy. Dr. Bright was a graduate of London University, and a man full of promise, and it is sad to reflect that though the overdose of cocaine may have been an accident, the toothache, which called for the use of this drug, was preventable, had attention been paid to the teeth at a sufficiently early period. It is very difficult to explain why men should so neglect obvious means of relief. It cannot be a question of pain, for they will suffer far more through the neglect, than through the cure of the disease ; nor can it be a question of money, for they will waste far more on fads and fancies which are but the pleasures of the moment. We cannot explain it any more than we can why many dentists take care of everybody else's teeth but their own.

We are glad to note that the Melbourne Dental Hospital has met with considerable success during the first year of its existence. At the first annual meeting of subscribers on the 27th July at the Athenæum, Mr. J. Iliffe (vice-president) occupied the chair. The report of the operations of the year was presented, showing that 1179 persons had been relieved at the hospital, the total number of operations being 1862. The balance-sheet showed that £235 had been received, and that a balance of £50 remained in the bank. In moving the adoption of the report and balance-sheet the chairman stated that the expenses had been kept down to the lowest point, but when students were taken for training more funds would be required, and he hoped the public would support a useful institution. Mr. L. A. Carter seconded the motion, which was adopted. The following gentlemen were appointed to vacancies on the committee:—Mr. Heath, Mr. Ludbrook, Mr. Macgregor, Mr. M'Intyre. Votes of thanks to the honorary staff and Mr. Ernest Joske (the hon. secretary), closed the proceedings.

It is very true that we are unconscious of half the dangers by which we are surrounded. It is our duty day by day to put our fingers in patients' mouths, yet how seldom do we think of the diseases which we might easily contract whilst so doing, Syphilis will at once occur to the mind as a very real possibility, and cases are known where this disease has so become inoculated into the finger. Tetanus would hardly be thought of, yet a dental-student, Baab, of New York, has just died from this disease, associated with typhus fever, which was inoculated through a wound, inflicted by the teeth of a young woman, who suddenly closed her jaws whilst he was examining a tender tooth. Such cases as this can hardly be guarded against, but they should make us all exceedingly careful in the matter of cleanliness. We know very well what a patient would say and do were they to contract a

disease from their attendant, be he medical or dental ; it would be interesting to know whether the attendant's claim for recompense would be upheld, should he make one under the above circumstances.

We are glad to hear that the efforts which have been made of late to endeavour to get dental help granted to "our sailors" has met with some sort of success. For a long time, as is well known, the Army and Navy Medical have been struggling to improve their position both socially and professionally. The Treasury have now been persuaded to allow a certain number of medical officers leave of absence, a *full* pay to attend the post graduate classes which are being held in London, and moreover, they are going to allow similar absence on full pay, to enable these officers to obtain instruction in dentistry. So far, so good, there must be an immense amount of work wanted where an Army or Navy are from home, and we could hardly expect to see separate dental officers appointed. It is well, therefore, that the medical officer should be trained in some sort of a way to do what is required at these times. But when the forces are at home we certainly think that the men would fare better, were they placed under the hands of an experienced dental practitioner rather than entrusted to the mercies of one, who can, at the most, have devoted but a week or two to learning just a few of the cardinal principles which underlie the theory on which we base our practical work. If there is one calling, however, in which practical work is of importance, it is dentistry. Now it is extremely difficult to understand how it will be possible for Army and Navy surgeons to acquire any dexterity in actual practical work in so short a time. It is perfectly true that none of the refinements of our work will be required of them, nothing but the roughest of ready methods will be expected of them. It must, however, be a step in the right direction and we may venture to hope that this little knowledge will call the medical staff over to our side in our endeavours to obtain really efficient dental aid for the services.

Dr. THEODORE CHUPEIN's recollection of how a medical friend extracted teeth fifty years ago, is sufficiently amusing to warrant repeating. He says :—" I recall, with many a smile, what I have often related of the manner which Dr. M——, a very popular and successful physician of Charleston, S.C., used to extract teeth fifty years ago.

At that time there were comparatively few dentists established for the practice of dentistry, and the rule was that if a tooth ached there was nothing to be done but "to have it out."

The doctor did not practise dentistry, but he had quite a run in the matter of extractions.

No operating chair embellished his waiting-room in which the operation was performed.

His assistant was a big burly muscular negro, who drove his visiting carriage.

When patients presented for the extraction of a tooth, regardless of sex, they were requested to lie on their back on the floor, (which was not even carpeted.)

The doctor straddled the patient and applied the forceps to the aching grinder, while "Sam," the assistant, knelt at the head of the patient, facing the doctor, and applied the palms of both hands on the sides of the head, at the parietal bones.

When the doctor was ready to "pull" he cried out lustily, "Press!!!" when forthwith Sam did press the head as if he would crush in the skull. The pain from the pressure exerted by Sam often dazed, or rendered the patient unconscious, which overcame the pain of extraction inflicted by the doctor, so that

"Uninjured from the dreadful close,
Nearly breathless *all three* arose."

It may be said, in card parlance, that between Sam and the doctor "Honours were easy."

Abstracts of British & Foreign Journals.

THE HISTORY OF BACTERIOLOGY.

By J. LEFFINGWELL HATCH, B.SC., M.D.,

Lecturer on Bacteriology and Assistant Demonstrator of
Morbid Anatomy in the Pennsylvania.

THE knowledge of microscopical organisms naturally advances hand in hand with the science of optics, and although the ancients believed the air and water to swarm with beings of such small size as to be invisible to the naked eye, yet it was mere hypothesis and lacked ocular demonstration. To Leeuwenhoeck, a naturalist of Holland, was reserved the honour of discovering and first describing the bacteria. This he did in his work entitled '*Arcana naturæ detecta*,' printed at Delphis Batavorum in 1680. His observations were made with simple bi-convex lenses fixed in a silver mounting. In order to give a comparative estimate of their size he placed a grain of dust one quarter of a millimetre in diameter under the same lense with the bacteria, and thus approximately measured them. In spite of instruments so crude, he was able to describe several species, and point out the great *role* that they play in putrefaction and decomposition. He pointed out their presence in water, in vegetable infusions, in the intestines of flies, frogs and chickens, in the *fæces* of man, and recognised the fact of their augmentation in diarrhoea, the first application of them to human pathology. He also demonstrated their presence in the tartar of the teeth and in saliva. It was a great event for those times, and made quite a stir in the scientific world. One does not know which to admire the more, the nicety of the results announced or the skill of the experimenter.

After Leeuwenhoeck, the study of microscopical beings was neglected for nearly a century. The difficulties met with in their study by means of simple lenses was enough to turn less hardy observers than Leenwethoeck to one side, and it was not until the discovery of the compound microscope that anything further was done towards investigating them.

It was Otto Frederic Müller who first applied the compound microscope to the study of the lower organisms, and he described and classified them in his two works.

The first, 'Vermium terrestrium et fluviatilium Historia,' published in 1774 ; and the second, 'Animalcula infusoria fluviatilia et marina, published in 1786. It was he who had the honour to put in order this crowd of microscopical beings, that the great Linnæus himself believed ought to be placed to one side, and for which he created his genus "choas," a veritable "*caput mortuum*," where all sorts of beings and things are jostled together.

Müller divided the bacteria into two genera : "Monads" and "Vibrios," which names are handed down to us to-day.

The species of the genus *Monas*, incompletely described and badly figured, are scarcely recognizable ; two of the ten species that he includes here are certainly short, rod-shaped bacteria, bacilli. He describes thirty-one species under the genus *Vibrio*, of which, however, only six are true bacteria. The other forms are really Algæ, Desmids, and Diatoms. His *Vibrio lunula* is a Closterium ; his *Vibrio acus* is an Euglena, one of the flagellate infusoria. Among the ciliated infusoria to be found in the genus *Vibrio* are the Paramœcii, the little slipper animalcules, and, of the Nematodes, the Anguillulæ.

Lamarck in 1815—1819 ; Bruguiere in 1824, and Bary de Saint-Vincent in 1824, have confined themselves in their works to reproducing intact or but little modified, the gifts of the Danish naturalist, so that up to the year 1883 little progress was made beyond what Müller had done in the eighteenth century.

Ehrenberg is the next to attract attention. Using perfected instruments, he made great progress in the study of microscopical beings. It was at about the time when the botanist Schleiden was carrying on his studies in plant histology—studies the result of which was to agitate the scientific world, and form the basis of what is now known as cellular structure ; I refer to his discovery of the cell in 1838. These results, as well as those of Ehrenberg, were due to the rapid advance of optics, and the improvement of methods of observation.

In Ehrenberg's grand work, entitled 'Die Infusions-thierchen als Vollkommene Organismen,' we find results that are greatly superior to those of his predecessors. He separates those beings which we are considering from those which had been associated with them, although differing so greatly, and reunites them in his family of the *Vibrionia*, which he des-

cribes in the following manner: "Filiform animals, without intestines, naked, without external organs, united in chains or filiform series by the effect of an incomplete spontaneous division." This family comprehends the four following genera:—

Bacterium: Little rods, rigid, without vacillating movements.

Vibrio: Filiform bodies, susceptible to undulatory movements like a serpent.

Spirillum: Filiform bodies in an inflexible helix.

Spirochæta: Bodies in a helix, forming a long, flexible string.

Dujardin takes the ideas of Ehrenberg and modifies them a little in his work entitled 'Histoire Naturelle des Zoophytes, Infusoires,' published at Paris in 1841. Here we find new and interesting details concerning the development of bacteria in diverse infusions and a description of the methods for obtaining and studying the different forms. The four genera of Ehrenberg he condenses into three, fusing the two forms *Spirochæta* and *Spirillum*, into one—a movement that has since been approved by many observers, the distinctive characteristics of the two genera having only a relative value of order far too slight as a basis for separation.

The results obtained at this epoch were weighty and for the most part to be preserved; certain ones have been many times confirmed and are still to be found in the best works.

The achromatic microscope was being perfected day by day, and in the hands of such able experimenters as Dujardin announced conclusions that could be considered as strongly supported, if everything was not made certain.

Up to this time the appearance of these beings so simple, these *animalcules* as they were called, in the infusions was regarded as a simple fortuitous phenomenon. At the same time very appreciable alterations in the media in question were observed, but they were far from supposing that there was a relation between these two—a relation of cause and effect. If, indeed, they sought to connect one or the other of them with the phenomenon, it was that they might cause the second to depend upon the first, thus making a law of the ancient adage, "*Corruptio uniùs, generatio alterius*." And, as Leeuwenhoeck had regarded the considerable augmentation of microscopical beings in the stools of diarrhœa, so many of the *savants*, Linnæus among others, were borne by the simple

views of their intellect to consider these *Vibrios* as the elements of contagion in many pathological states, although nothing positive had been advanced and not a single fact was forthcoming to support the entirely gratuitous suppositions. The minds of scientists were so little turned from this direction that Davaine and Rayer, in 1850, pointed out, quite simply and merely as a curious fact, and without attaching any great importance to it, the presence of rod-shaped bacteria in the blood of animals dead from the curious disease called "*sang de rate*."

The auspicious moment at last arrived, and Pasteur appeared on the scene. He established with certainty the close connection, or relations of cause, which unite the alterations in certain liquids, certain fermentations, to the development and to the life in the interior of the most simple living beings, the bacteria. In his work on lactic fermentation, he has laid the first certain foundation of bacteriology, by the physiological study of these beings. What he demonstrated for this fermentation he extended to others and arrived in forming that train of studies which constitutes one of the most glorious scientific achievements of France.

Guided by the principles that Pasteur promulgated, Devaine went over the observations that he had made several years previously with Rayer upon the blood of the spleen, and was able to establish, by a series of experiments, and a line of able deductions, that the cause of the malady was certainly bacteridian, as bacteria were found in great abundance in the blood of sheep ill or dead from that disease.

Pasteur has shown the way to follow, in elucidating, in all its details, a terrible disease, the ruin of the raisers of the silk worm, *la flacherie*, as it is called in French, which is manifestly bacteridian in origin. It was the first complete study of a contagious affection, and since then, from these remarkable teachings, luminous conclusions have been drawn relative to the study of maladies recognized to be of the same origin, when the same questions of contagion, of recidity, of heredity, of media, which play so great a *role* in the ætiology, and the pathogenesis of infectious diseases, arise.

Koch, following in the footsteps of Pasteur, has made remarkable advances in the science of bacteriology, introducing certain refinements in the *technique* which have facilitated the study, and laid a basis for a more exact classification.

We must not forget to mention the names of Brefeld, Van

Tiegham, Prazmowski, and Buchner, in connection with Koch, as they have played a prominent *role* in work in which he was the pioneer, and they have all been followed by able investigators in many countries.

The great feature of Koch's work was the pointing out of the advantage of a solid medium; but gelatine had already been employed by Vittadini, in 1852, and potatoes and turnips had been used in Germany.

Coze and Feitz, in 1872, showed that the profound changes in the blood, in the infectious diseases of human beings were also due to the bacteria, and they made an exhaustive study of one of the most terrible of these infections, viz., *septicæmia*.

The most beautiful application of these fecund ideas are found without contradiction in the researches upon anthrax, where men like Koch and Pasteur have exerted themselves to the utmost, and have been able to make the study of this malady the basis of the germ theory of contagious diseases.

Since then this science has advanced with a rapid stride, thanks to the labours of assiduous investigators throughout the world, among whom to be noted as the foremost, besides those already mentioned, are Chauveau, Cornil, Chamberland, and Roux, in France; Klebs, Flügge, Gaffky, Löffler, Eisenberg, in Germany; Lister, Crookshank, and Klein, in England; Sternberg, Formad, Gibbes, Shakespear, and a few others, in America.

The morphology and the physiology of the bacteria, after having been in great honour, has unfortunately been relegated to a second place, and almost eclipsed by the interest and splendour of the grand pathological gifts; and in spite of the labours of such botanists as de Bary, Naegeli, Cohn, Zopf, and physiologists like Duclaux and Pfeifer, the progress of bacteriology as a science has been slow.

Much work has been done that is useless, and many erroneous conclusions have been drawn, yet on the whole there has been laid a solid foundation, and ways have been opened along which the careful observer can reap a rich harvest.

Pharmaceutical Journal.

FACIAL HEMIATROPHY.

THE *Neurologisches Centralblatt*, No. 15, 1891, contains abstracts of several cases of facial hemiatrophy. The first is recorded by Borgherini (*La Psichiatria*, viii, fas. 3 and 4). The patient was a man, aged 63. He had had chronic inflammation of the right lachrymal gland, which was incised. Shortly afterwards he developed localised pain in the right orbit, creeping sensations and a feeling of numbness in the adjacent skin, chronic contraction of the right forehead and face muscles, atrophy of the tissues on the right side of the face, and opacity of the cornea. This condition was on the left limited by the middle line of the face and on the right by the anterior border of the temporal and masseter muscles. The second case is recorded by Muratow (*Dratch*, 1891, No. 25). It is that of a woman who sought advice on account of cramp in the muscles of mastication. This began on the right side and had a clonic character at first, but soon became bilateral and tonic. There was atrophy of the right side of the face, affecting both the lips and the tongue. There were no electrical alterations in the muscles. There were several pigmented spots on the side of the face, and the skin had the appearance of scleroderma, but this condition had appeared before the cramp in the muscles. The third case is by Jankau (*Deut. med. Woch.*, 1891, No. 26). The patient, a girl aged 22, had for two years noticed great pallor with yellow pigmentation and atrophy of the right side of the face, extending over the distribution of all three branches of the trigeminus, and she had lost much hair on the affected side. About the time of the appearance of the hemiatrophy the patient began to suffer from enlargement of the thyroid and ozæna. The next case is recorded by Dixon (*Dublin Journ. of Med. Science*, February, 1891). In a boy, aged 11 years, there followed upon a violent blow over the left hip scleroderma of the left half of the body, the left side of the face, and the left extremities, with atrophy of the affected arm and leg, hemiatrophy of the face, and alopecia of the left half of the body. The last paper is by Girard (*Revue Med. de la Suisse Romande*, 1891, No. 6). He cut through the sensory portion of the trigeminus in the skull in dogs, and this was followed by hemiatrophy of the face, atrophy of the muscles of masti-

cation, thinning of the skin, atrophy of the bones and of the tongue on the same side. He therefore concludes that the trophic fibres for the face run in the trigeminus and not in the facial nerve.

British Medical Journal.

ANTIPYRIN IN AFFECTIONS OF THE PHARYNX AND LARYNX.

M. E. SAINT-HILAIRE (*Archives de Laryngologie*, September, 1891) refers to a recent paper by himself and M. Coupard, in which they described the therapeutic value of antipyrin, applied locally, in certain throat affections. By its means they were able to cure a variety of complaints dependent on undue sensibility of the pharynx and larynx, such as spasmodic cough, sensation of pricking in the throat, or of a foreign body, etc. These results seemed due to a local anæsthetic effect of antipyrin, and M. Saint-Hilaire has performed numerous experiments with the view of determining the anæsthetic properties of antipyrin. He draws the following conclusions from these experiments : 1. The anæsthesia produced by cocaine is complete, and applies to tactile sensation and to sensations of heat and cold. 2. The anæsthetic lasts from one to two hours. 3. In order to produce this effect the strength should be not less than 30 per cent. The solution employed by M. Saint-Hilaire is of a strength of 40 per cent. He thinks that antipyrin will be found especially useful in cases where a prolonged analgesia is desired ; thus, in tuberculous ulceration, the pain may be kept under by painting the parts with the antipyrin solution two or three times a day. It will be found useful in those affections where either the reflex element or the painful element predominates. Moreover, antipyrin possesses an antiseptic property which will render it additionally useful in certain cases. Of course, when for the purpose of operation an anæsthesia of short duration is required, cocaine is preferable, as the effect is more rapidly produced, and is more complete while it lasts.

THE FIRST MOLAR.

By H. B. TILESTON, D.D.S., Louisville, Ky.

The first, or sixth year molar has been the subject of more essays and discussions than any other member of the dental family. Within the last decade it has passed, at the hands of various writers, through every stage of treatment, from total and uncompromising destruction, to religious conservatism; it has been denounced as a useless incumbrance to the dental arch, an insult to the intelligence of mankind at the hands of an unwise creator, on the one hand, and extolled as the pillar of the arch, upon the other.

It would seem that the subject has been so thoroughly exhausted as to leave nothing more to be said, and indeed I feel almost called upon to apologize for again presenting such an antiquated chestnut (excuse the expression it is an apt one) to the consideration of this intelligent assemblage. My object in doing so is not to advance anything new, but rather to bring again to your attention some ideas concerning the first molar advanced recently by more original minds than mine, in the hope of stimulating discussion that may result in benefit to many of us.

About the only question considered in discussing the first molar is the one of extraction.

First : Shall the first molar ever be extracted except when extensive decay has rendered its preservation impossible. And

Second : If from any cause extraction has become necessary at what period in the development of the teeth shall it be done ?

In addition to the importance of the first molar as a masticator (being the largest of all the molars, its value in the work of mastication should rank first) it has a function, which at the time it is exercised is infinitely more important.

Dr. E. A. Bogue, of New York, in an essay in Vol. 31 of the *Dental Cosmos*, August number, entitled, "A study of the visible changes that take place during the development of human teeth and their alveoli," points out the functional value of the first molars, as the support of the jaws during the shedding of the temporary and the eruption of the permanent teeth.

The sixth year molars appear and assume their positions in the jaws long before the temporary teeth begin to be shed, and they have come thus early in conformity to a wise provision of nature, that they may establish and maintain the normal relation of the jaws to each other—what we are accustomed to term the “bite.”

While the temporary teeth are being replaced by the permanent, it often happens that by the early decay of the temporary, or their premature extraction and the slow advancement of the teeth of replacement, broad spaces occur where there is no contact between the upper and lower teeth for months. Were it not for the presence of the large, strong abutments furnished by the first molars, the pressure of the jaws upon the young, growing teeth would prevent their full development, and the bite would be shortened, with consequent excessive overlapping and protrusion of the upper front teeth. More than this, the first molars continue to rise higher as they develop, until they establish a line considerably above the level of temporary teeth and carry their alveoli with them, and thus fix the length of bite and relieve the smaller anterior teeth of undue pressure until they have obtained their normal plane.

The evil results of the extraction of the first molars, especially the shortening of the bite and the interference of a normal articulation of grinding surfaces, is excellently shown in the illustrations of cases in Dr. Bogue's paper and also by the illustrations in Dr. I. B. Davenport's paper on “The Dental Arches of Man,” in the July number of *The Cosmos*, Vol. 29.

After the completion of the first dentition, the elongation of the jaws is mostly due to growth back of the temporary molars, to provide for the three permanent molars. The early extraction of the first molars, prevents to that extent the normal growth of the jaw, and may result in many cases especially with females, in a noticeable deformity of the features.

In view of these facts, and they have been ably demonstrated as facts by Dr. Bogue, Dr. I. B. Devonport and others, does it not appear to be our duty, our sacred duty, to exert our utmost skill to preserve the first molars of our young patients?

At a critical period, when the jaws are so dependant upon their support, if we find the first molars so badly decayed that their grinding faces are completely destroyed, which is fre-

quently the case, we should build them up by crown or contour of amalgam, so that their height shall be normally restored. In such work we have a useful ally in copper amalgam, which may be so manipulated as to set quickly, and make a contour secure before the patient is dismissed.

If the teeth are of such a character as to promise but slight or no hope of permanency, and we feel confident that they will be lost early in life in spite of anything art can do for them, it is our province to choose a time for their extraction when the least damage to the arch will result.

When is that time ?

Dr. Davenport says the least injury will be done if the first molars are extracted at about the time of the eruption of the second molars.

In most cases such a time is probably the best, for the reason that the second molars will then move forward bodily and take the places of the first molars instead of tipping over toward the bicuspid, as is the case when extraction is resorted to later.

But it sometimes happens that the second molars begin to make their appearance before the length of the bite has been attained by the teeth anterior to the first molars for support in which case, and in the light of our knowledge of the function of the first molars, inexpedient to extract them at that time, even for the sake of securing the bodily advancement of the second molars. It were better to postpone extraction until other teeth have attained a height equal to that of the first molars upon which the jaws may find proper support, and then we might hope to avoid the evil results indicated above. Of two evils we chose the lesser.

Dental Review.

REAMING ROOT CANALS.

There are many reasons why a reamer should be used in a canal, and few, if any, good reasons against the practice. If a freshly devitalized pulp has been removed, there is less reason for a reamer than in most cases, yet by using the reamer, and by no other way, we assure ourselves that none

of the odontoblastic layer is left clinging to the canal walls. In diseased teeth, of course, the reamer is a prerequisite, because it removes the softened dentine which is also present. Removal is a thousand times better than disinfection. To those who are horrified at the dangerous course here advised, we have but to say : " Gentlemen, do you enlarge the canals of roots when you desire to place an artificial crown ?" and whilst they search for a reply, we remark that it is as permissible with the natural crown *in situ*, as when it has been cut or lost. The root is pathologically and physiologically responsive similarly, to similar treatment.

Dental Mirror.

HOW TO KEEP NEEDLES AND SMALL INSTRUMENTS FROM RUSTING.

Dr. R. H. M. DAWBARN.

For the past year I have been pleased with the results of a new plan—new to me, that is, though very probably not to others. This is simply to keep my needles in alcohol. For extreme safety against rust I use absolute alcohol, but the commercial article would probably be efficient. At least, some needles that I have kept in common alcohol for a month as an experiment are as bright as ever. Upon buying the needles I immerse them in benzine to remove grease. Then, after running them through a towel, I plunge the point (a cutting-edge Hagedorn) into a bit of cork the size of a pea—to avoid dulling from jolting—and finally, with their corks, they are put and kept in a wide-mouthed, glass stoppered bottle filled with absolute alcohol. After use, I sew through a thick, wet, soapy towel repeatedly, cleanse the eye with a thread, immerse in benzine, and finally replace in the alcohol. This last is certainly an efficient disinfectant, besides being an excellent protector against rust. By the bye, I long ago gave up using (save in bowel work) any other than Hagedorn self-threading needles, which are a decided comfort, and, when properly made, do not cut the thread.

Medical Record.

THERMOMETERS.

A HINT.

THERE are some thermometers attached to vulcanizers which give considerable annoyance, in the process of vulcanizing, by the column of mercury becoming *divided*. The divided portion will remain at a fixed point in the top of the tube, while the remainder descends into the bulb when the heat is removed. This gives annoyance, and uncertainty as to whether the heat has been kept up to the proper degree. It has been recommended to remove the thermometer by unscrewing it from the top of the vulcanizer, and by taking it in the right hand striking it sharply into the hollow of the left hand, being careful not to strike the bulb (hit only the cases to avoid breaking the thin glass which is only an extension of the tube) of which it is made. This will *sometimes* cause the separated columns of mercury to unite and no further trouble of the kind will occur. This, however, will not always be accomplished, and we have found when a trouble of this kind occurs with a thermometer, to unscrew it, as advised, but instead of seeking to make the mercury in the tube unite with that in the bulb, to turn it *upside down*, and make what is in the bulb unite with what is in the tube. Worked in the way we have found the mercury to coalesce perfectly, and not cause annoyance of separating as it sometimes does.

Dent. Off. and Lab.

HEADACHE CAUSED BY ARTIFICIAL DENTURE.

W. T McLEAN, M.D., D.D.S., CINCINNATI.

Five months ago Miss S——, twenty-six years of age, was referred to me by a physician for the purpose of relieving a severe frontal headache, the result of wearing an upper vulcanite denture. I elicited from her the following: At eighteen years of ages she had all her upper teeth extracted; six months afterward a vulcanite denture was inserted, and was worn with much discomfort for four years, when she had a new denture constructed of the same material. A few weeks

after its insertion she suffered from a burning sensation on the palate, and a severe frontal headache. On removing the denture she would obtain relief in a short time. She visited her dentist for relief, and he recommended a black vulcanite, or gold base, instead of the red vulcanite. The black vulcanite denture was substituted, but the troubles reappeared. Another dentist was consulted ; he inserted a denture on gold base which was a decided improvement. The burning sensation did not recur, but the frontal headache still remained. She suffered at times intensely. The gold denture was worn at intervals for two years before her call on me. I found the mucous membrane in a comparatively healthy state, being only slightly congested ; the palate flat, ridge low and narrow, anterior portion of ridge very flabby, buccinator muscle attached very low down on the right side. Twelve teeth remained in the lower jaw, and were all in good order. The gold denture did not fit well, was easily displaced, and the articulation was not good. I decided after some consideration to anesthetize the patient and remove the flabby portion of ridge, which extended from the location of the first bicuspid teeth on each side to obtain a solidity of the ridge. This I thought would benefit the patient by enabling me to make a better fit. Four months after my operation I had the pleasure of seeing the ridge healthy, solid and uniform. I constructed a maroon vulcanite denture being careful to obtain correct articulation. She has been wearing it for five weeks without the slightest discomfort of any kind. Knowing that the ITEMS of INTEREST family is composed of many of the most scientific and skilful prosthetic dentists in America, I report this case for the purpose of learning what caused this severe headache and cured it. It is evident that vulcanite was not the cause of this trouble ; but what was ?

Items of Interest.

THE OPENING ADDRESSES AT THE MEDICAL SCHOOLS.

FROM DR. G. FIELDING BLANDFORD'S ADDRESS AT
ST. GEORGE'S.

CAN anything sound more marvellous, would anything have appeared more marvellous to our fathers than the course

and progress of Pasteur's researches? Pasteur was, and is, a chemist. His first researches were purely chemical, and it was while investigating the discovery by Berzelius of what are isomeric bodies—that is, compounds which possess an identical composition, but are absolutely different substances when judged by their properties—that he discovered the reason why the two acids contained in wine less differed the one from the other, the one deviating the plane of a polarised ray of light to the right while the other does not. He proved that the inactive acid is made up of two compounds, each possessing the same composition but differing in properties, the one being the dextro-rotatory tartaric acid, the other a new acid rotating the plane of polarisation to the left. And these two acids can be separated one from the other by a process of fermentation started by a mere trace of a special form of mould. Here was the commencement of the long train of experiments and research which has gone on till now, and has produced such marvellous results. This fermentation, which was the result of all these experiments, led to the investigation of the fermentations of beer and wine, which up to this time were not to be explained, and were an enormous difficulty to chemists, brewers, and wine-makers. The beer and the wine often became vinegar, and none knew why. Pasteur taught the brewer and the wine-maker to take the microscope into the brewery, and by it to ascertain whether the yeast is pure or whether it contains forms which will turn the beer sour and render it worthless. He taught the value of cleanliness, the necessity of excluding disease organisms from the pipes and vessels. In short he did for brewers and brewing what Sir Joseph Lister has done for surgery, guided by Pasteur's investigations. In this way he conferred an inestimable benefit on all engaged in these trades. His next labour was in a totally different direction. In 1865 he was entreated by his friend Dumas, the celebrated chemist, to try to find a remedy for the silkworm disease which was devastating the silk districts of France, and had been raging there for twelve years, till the silk industry was brought to the very verge of ruin. It was a matter of national importance. Every conceivable remedy had been tried, and tried in vain. As happens so often, all kinds of nostrums had been used. "Gases, liquids, and solids had been laid under contribution. From chlorine to sulphurous acid, from nitric acid to rum, from sugar to sulphate of

quinine—all had been invoked on behalf of the unhappy insect.” All the practical people having failed, at last a scientific man was called in. They had ascertained before his arrival that certain microscopic corpuscles were to be seen in the blood and tissues of the diseased caterpillars, and even in the eggs, but if they were not visible in the eggs it was supposed that the latter were free from infection, and that their incubation would therefore be successful. Pasteur showed that unless the moth were free from disease the eggs would not be healthy, even if no disease was visible in them. He proved this against the opinion of many by a series of experiments and prophecies founded on them, and in twelve out of fourteen cases there was an absolute conformity between his prediction and the result, and none could resist the conviction forced upon them. Now, his method was this. Every moth and her eggs were kept separate, and when the moth had laid her eggs, her body was crushed and carefully examined by the microscope. If disease was found the eggs were burned; if there was none they were saved. This process is still carried on, and by dint of rigid examination the silk industry of France, which is a matter of millions sterling, has been saved.

VICTOR HORSLEY, F.R.S., at University College.

A coping-stone to the edifice which few men add, and yet which I believe to be of fundamental importance—is, foreign travel and experience. In only one other profession—the law—is it so necessary for a man to have studied human nature as much, and in a very much more varied shape, than that presented to him by the microcosm of hospital life or British private practice. There is one way, and but one only, by which this consummation may be attained, and the acquisition of which will go further, believe me, to enable you to reap the fruits of years of earnest work as a student than anything else, and that is experience abroad. At present, many men seek this final qualification by “taking a ship,” as it is said; in other words, going as surgeon on some steamship or other. This is but half doing it at the best, and has the disadvantage that the horizon is very limited, being practically bounded by the number of persons on board, who, as a rule, require very little attention. Besides, a man has

"no time" or inclination to read on board ship. For these reasons, six months, or at the outside a year, will give all the experience that one can draw with benefit from this method of studying the whims and fancies of our fellow-men. The far better plan is to go abroad to attend hospital practice on the Continent. Many are deterred by the expense, others because the wretched education of our schools in foreign languages makes them feel helpless when out of sound of their mother tongue. Neither of those considerations should weigh for a moment. Living abroad is extremely cheap, and a few evenings a week before starting will go a long way towards overcoming the last mentioned difficulty; and if there is no time for that even, there are ample opportunities at Vienna, for so many English and Americans now go to work there, that the specialist courses are actually given in English. Besides, it is not absolutely necessary that you should understand the language at first. The study of what you see will for some time be of ample interest and instruction, and meanwhile you can speedily pick up enough to understand what is said of a case, especially as fortunately everywhere medical terms are almost cosmopolitan. I cannot sufficiently express the very varied way in which the experience of foreign work reacts upon one; but perhaps a concrete example will make it clear that it is not only a matter of general improvement, but an actual question of education, which may or may not weigh heavily in the scale for or against you in after life. Take, for instance, the joint disease in locomotor ataxy. Years after Charcot had carefully described this condition, and deposited specimens at the Salpêtrière, its bare existence was discussed in this country, and even discredited in open discussion. So, too, with functional nerve disease. I feel sure that no one who has not been to Paris, and seen the hysteroid condition in its extreme developement, can realize fully this form of neurosis or how it is to be dealt with. The breadth of thought, besides, to gain which nothing is better than travelling, and which is absolutely necessary for you to be able to gauge the depth of people's minds, is really the outcome of your trying to understand others; and it is obvious that without such special training a man must be very exceptional who can, on his entry into work, visit a number of patients in a morning, listen quietly to all their innumerable complaints, and sympathise with all their wants.

From DR. W. DUNCAN'S address at Middlesex.

You must supplement your lectures and notes by reading books. My plan was to make an abstract of each book I read, written in ink in a good-sized note-book ; and it is surprising how quickly you can do this, and how small a space it takes up, especially if you arrange the facts in order under their proper headings, leaving a margin at the side for this purpose. When once you have made an abstract of a book in this way, if properly done, you need never look at the book again, or only for reference. You can read your abstract over in one-tenth or one-twentieth of the time required for reading the book. Besides, you have read the book in a way you could never have otherwise read it. To make a careful abstract or summary, you must read every word and weigh it well, omitting nothing of importance. It is also an excellent training in the power of condensing expressions, a most valuable acquisition, as you will find, when you come to write an examination paper. Reading, too, is much more interesting when done in this way. After a time the process of epitomising becomes absolutely fascinating. An orderly and methodical habit of writing will teach you to think in a similar fashion, which is one of the qualities most needed in our profession. It is a capital plan to supplement your notes of lectures from books ; for example, in notes of lectures on medicine, when you read some work on the same subject, have your lecture notes before you, and add any facts mentioned in the book which you do not happen to have down in your note-book for this purpose, and interpolated matter from several sources on the opposite page. This may often take the place of making a complete abstract of a book, and in one note-book you have the contents not only of a course of lectures, but also of several works on the same subject. I dwell on these tedious details, gentlemen, because I feel it to be of the first importance to you to get into a right method of working. By doing so you will find your work an increasing pleasure, as it develops in you more and more a command over the knowledge you have gained.

From SIR GEORGE HUMPHREY'S ADDRESS at St. Thomas's.



One of the important changes in medical study which have taken place in the half century of my time is increase of accuracy, increased accuracy in observation, and increased accuracy in recording, associated with the greater refinements of chemical analysis, and the use of the microscope and other scopes, of the clinical thermometer, the experimental work in the laboratories, and the more careful records of cases, of post-mortem appearances, &c. It is by accuracy that almost all great and good work is done. Accurate work is good work, and inaccurate work is bad work. Accuracy, bear in mind, is but another word for attention and painstaking. Upon these two are reared the edifice of talent and success. Talent, as has been well observed, is the faculty of painstaking; and that education alone is good education, whatever may have been the medium employed, whether classics, mathematics, or any other, which cultivates attention and painstaking. This applies to all the walks of life. Nelson won his battles because he was a serious, careful, attentive, most painstaking student of naval tactics. Wellington gained his victories because he gave great attention to the details, small and great, of his campaigns. All great orators, from Demosthenes downwards, have taken great pains in preparing their speeches. All great operators—by great operators, I mean successful operators—consider beforehand the plan of their operations, the instruments they will require, the difficulties they are likely to encounter, and the means they will employ to meet them. They sketch in their mind's eye or on paper the stages of the proceeding and the attendant possibilities, just as Nelson sketched the line of action he proposed to follow, and which he carried out, at Trafalgar before the battle commenced. Such men have that well-grounded confidence which prevents nervousness. Nervousness, be assured, whether in operation or examination, indicates want of attention, want of preparation, and consequent want of knowledge. You may dispute this, you may say that you cannot help being nervous, but you cannot always command your attention, that you are liable to be distracted; but remember, this is chiefly, to a large extent at any rate, because you have not been in the habit of commanding your attention, have not exercised the practice of controlling the exacting obedience from your mental faculties, be-

cause you have not taken pains to train your mental batteries to converge well and quickly upon the required point ; in short, because the training of that faculty upon which what goes by the name of talent essentially depends, has not been cultivated in you. Do not, therefore, confess to nervousness. Certainly do not make it to yourselves or others an excuse for imperfection, but strive to prevent it ; and you will best overcome it by acquiring that knowledge which gives confidence.

Thoughtful painstaking is one of the cöordinates with intelligence. A bird will build its nest without it, but it is quite certain that you cannot do the like for yourselves. Our bodies are not intended to be mere automata, but are calculated to serve high purpose under the controlling influences of intelligent will. There must be the will, and where the will is the way will develop itself. To those who have the faith of strong will and determination the mountains of difficulty are removed and cast into the sea. They look large before you, and they are large. It is best for you to feel that they are so, and to each generation of students they are larger than they were to their predecessors. The steps of knowledge to be climbed, and the examination—portals to be passed are ever on the increase. They have increased not a little during the half century that I have spoken of ; and I must confess to the feeling that were I now an occupier of the benches before me I should look ahead with some dismay, and I wonder whether I should have the determinate will to make these many mountains remove. However, we may assume that the means and facilities for overcoming the difficulties have increased in like proportion to the difficulties themselves. As the mountains have enlarged, the provisions for scaling, for tunneling, and for removing them have been multiplied. Books have been adapted and teaching has been systematised ; museums have been enlarged, laboratories have been instituted, and clinical work organised.

From MR. W. F. FAVELL's address at Sheffield.

Let me also beg of you young men about to commence practice not to resort to the reprehensible, though more open method, of advertising your skill, or allowing well-meaning but injudicious friends to do it for you. Depend upon it, such unworthy means do not succeed in the long run. You may

gain some temporary success, you may impose upon the credulous, but it is only by honest work, honourable conduct, and a conscientious determination to do what is right, that you will succeed to your own satisfaction, or secure the confidence of those whose good opinion you most highly value. And in the early months, or first year or two of practice you may find a difficulty in your relation to your patients—perhaps from want of confidence in yourself, perhaps partly from youthfulness (of which you will mend every day) you may fail to gain the confidence of your patients in such degree as you could wish ; but do not be discouraged at this—it is what all young men have to put up with ; but I will tell you what I believe will help you to attain this object more certainly than anything else, and that is to cultivate a spirit of true and genuine sympathy. I am afraid many young men in strong and vigorous health are not very sympathetic. I must confess that, in my long experience, I have seen one or two young house-surgeons get into the way, from routine and habit, of looking upon patients who presented themselves at the hospital as simply “cases,” and treating them almost as if they were pieces of machinery, and were not endowed with the ordinary feelings and sensations of human beings. Now let me beg of you never to let familiarity with suffering blunt your feeling of sympathy with the sufferer. To every right-minded man, to everyone who has a heart to feel and an intellect to think, distress and suffering accentuate and intensify sympathy ; and you will find that not only is a kind and sympathetic manner a blessing to your patient, encouraging him, giving him confidence, and helping him to summon fortitude to bear his trouble, but will be also a blessing and a vast advantage to yourself, for it will bind him to you by bonds of gratitude and affection stronger and more enduring than any amount of purely skilful treatment could call forth. You will meet with many patients who cannot appreciate the skill you may show in your treatment of their ailment, but who will repay you with warmest gratitude for sympathy with their sufferings.

From WALTER G. SPENCER'S address F.R.C.S.,
at Westminster.

It is proposed to extend the compulsory medical curriculum to five years. The first of these should be occupied by scientific subjects—zoology and botany, chemistry and physics—as is the case now at the universities. The study of botany has undergone many changes since the time when the physician had to gather and prepare his own drugs. We have in the practical botany of to-day a course most suitable for obtaining an acquaintance with microscopic objects and for commencing the study of vital processes. The study of the anatomy of creatures simpler in their structure is the proper way of approaching the difficulties of human anatomy. At the present time all the non-university men commence a scientific education with lectures on the circulation and human bones, and may take six months before they begin to grasp the meaning of the words which fall on their unaccustomed ears and to accommodate themselves to the new methods of learning, while it takes them about half the course of histology to see objects clearly under the microscope. Of equal, or of more urgent, importance is a preliminary knowledge, not only of inorganic but of organic chemistry. Now a non-university student has to learn about the chemical composition of the blood and the changes occurring along with coagulation within six months of starting science. In the absence of any knowledge of organic chemistry, physiological chemistry becomes simply a question of committing certain words to memory ; but, beyond this, there are the problems of pathological chemistry. It is from chemistry that medicine looks for its future, but what share can a man take in that advance who has not as a student gained even the elements of the subject ?

From SIR J. CRICHTON BROWNE'S address at Leeds.

Now the popular impression assuredly is that it is well with old age in these days. Paragraphs which appear in the newspapers now and again, pointing out that a dozen old people whose deaths are recorded in the *Times* on some particular

day have collectively beaten the record of Methuselah, and the striking decline in the death-rate of England and Wales which has been going on for the last thirty years has created a belief, fostered by those genial optimists, whom we have always with us, that we are advancing towards health and longevity all along the line. Well, the reduction in the death-rate in this country is an indisputable and gratifying fact. The new census returns indicate that that reduction has not been quite as great as our calculations founded on estimated population had led us to hope, but still it has been large and remarkable. The improved drainage of land and construction of houses, the enforcement of vaccination, the vastly increased attention bestowed on cleanliness (personal domestic and civic) and on all sanitary requirements, and the accumulated wealth of the nation leading to a higher standard of living, have resulted in an enormous saving of life, but I must call upon you to note what is often overlooked, that this saving of life has been effected mainly in its first half. It is amongst infants, children and young persons, that the large reduction in that rate has been comparatively trifling. I am not going to worry you with statistical tables which I have prepared, but I may tell you generally that since the year 1859 the decline in the death-rate has been 17.6 per cent at all ages under 55, and only 2.7 per cent. at all ages above 55. The principal decline has taken place at ages under 35; after 45 the decline is insignificant, and from 65 to 74 there has actually been an increase in the death-rate.

While increasing mortality from degenerative diseases diminishes our prospects of enjoying a ripe old age, the increasing prevalence of minor degenerative changes enhances the probability that we shall be plunged into a premature old age and become decrepit while still in what used to be considered the prime of life. Men and woman are growing old before their time. Old age is encroaching on the strength of manhood and the infirmities associated with it are stealthily take possession of the system some years earlier than they were wont to do in former generations. Deaths due simply to old age are now reported between 45 and 55 years of age, and in large numbers between 55 and 60, and there has been a reduction in the age at which atrophy and debility—another name for second childishness—kill those who have passed middle life. Presbyopia, or the long-sightedness of old age, in which near objects cannot be distinctly seen unless held at a considerable

distance from the eye, is believed by some experienced ophthalmologists to begin, as a rule, rather earlier than it used to do. No trustworthy statistics on the subject exist, and of course general impressions ought to be received with caution, for it must be difficult to distinguish how far the early recognition of ocular failure in these days is attributable to the increased care bestowed on the eye, and how far it should be ascribed to untimely invasion, but I certainly attach great weight to the opinion of Mr. Critchett, who says, "My own experience, now extending over a quarter of a century, leads me to think that both men and women now seek aid from glasses at an earlier period of life than their ancestors." Very significant also is the statement of Mr. Brailey that "people who have lived long in hot climates like India become presbyopic four or five years earlier than they would otherwise have done," for life in a hot climate really means excessive wear and tear to a European. The ordinary age for the adoption of spectacles for reading used to be 50, it is now, I believe, nearer 45.

Dentists tell us that the absorption of the alveolar processes of the teeth, leading to their looseness and loss, and lastly to the edentulous condition which more than anything else assimilates old age to infancy, sets in now far sooner than it did in former generations, and dermatologists are unanimous that baldness, which Dr. Liveing says affects chiefly people of nervous temperament with active minds, but of feeble general health, and from which agricultural labourers are most of all classes exempt, begins now earlier than it formerly did. As regards baldness, Mr. Brailey reminds me that we may infer its vastly extended prevalence in modern times from the fact that the little children who fell victims to the she-bears cried out "Go up thou bald head," to Elisha. The condition was then so rare as to be a reproach, whereas now, it may be still sometimes a subject of genial banter, it is far too common to be regarded as flagitious.

Senile insanity due to atrophy of the brain, or exaggerated dotage, is, I feel sure, far more common than it once was, and declares itself on the average at an earlier age than it used to do; and I know few more gloomy experiences than to visit our mammoth metropolitan asylums, and wandering amongst the masses of human wreckage there heaped up, to notice the numbers of prematurely old men and women. And senile melancholia, which is sometimes the precursor of dementia

but which often stops short of it, is in a more marked degree spreading amongst us, and including in its victims an increasing number of those who are not really senile as years are counted. Suicides are increasing at all ages ; they rose in England and Wales from 1,340 in 1864 to 2,308 in 1888, and from a ratio of 64 to one of 81 to a million living ; but it is after 45 years of age that the vast majority of them occur, and it is between 45 and 65 that they are increasing most rapidly. And it is to be remembered that each case of suicide represents a large number of cases of melancholia so pronounced as to be certifiable and an exceedingly large number comparatively mild, of which we have no official cognisance. My belief is that mild senile melancholia—a state of mental depression falling short of madness, but still morbid enough—occurring at the turning point of life or soon after it, is a lamentably common complaint, often concealed, but sometimes accidentally discovered, and revealed far more frequently to the general practitioner than to the specialist. Scores of men around us, showing their first grey hairs, who in business and social intercourse wear a smiling countenance, are tormented in private, during the silent watches of the night or at the garish dawn, by a despondency that they can scarcely explain or that centres in fears they know to be groundless, but that embitters existence, and sometimes renders it almost unendurable.

I have argued that old age is being shortened and that it is overtaking us before its time, and that the cause of this is to be found in the immoderate excitement and fatigue of our modern life, and it may be well now very briefly to inquire what old age really is and whether as we know it is inevitable.

And to the question “Is old age inevitable?” I would reply, Only in a sense. All created things are subject to a law of evolutionary change. Even the stars grow old. Some of these heavenly bodies have spectra which indicate that they are in the early adult and most persistent stage of stellar life. Others in what is called the solar condition present appearances which prove them to have attained to full maturity. And others again tell by the constitution of their rays that they are in advanced old age and approaching extinction, and, by the way, it is curious to note that the young stars are white, and those that have passed their best, orange and red in colour ; whereas among human luminaries

whiteness is a sure sign of antiquity and an orange or red tinge the prerogative of a sanguine variety of youth. And the same law of evolutionary progress that controls the gigantic bodies, that in streams, clusters, and spirals, traverse the avenue of space also dominates the organic bodies that in such infinite variety move on the surface of our planet. Weismann has argued that the amœbæ, algæ, and unicellular organisms such as the infusoria are practically immortal, and if not destroyed by heat, poison, or external agencies will go on for ever repeating their simple processes of nutrition and reproduction. But however this may be, there can be no question that all high multicellular forms of plants and animals with well differentiated organs are born with the germs of death in them, and by a physical necessity of their nature pass through certain phases of life. In the human being the metabolic activity of the body, which at first is sufficient not only to cover daily waste but to build up new material, a little later is equal only to balance the physiological requirements of the system and at last is too much reduced even to sustain in its entirety the existing frame. Thus we have three great epochs in human life, one of growth, one of equilibrium, one of decline ; and it is the last of these which, strictly speaking, constitutes old age—the old age which is inevitable, but which as regards its duration and characteristics is something very different from what is generally understood by the term.

Pythagoras used to divide the life of man into four equal parts. From the first to the twentieth year he called him a child ; from the twentieth to the fortieth a young man ; from the fortieth to the sixtieth a man ; from the sixtieth an old man—a man finished ; and after this period he reckoned him no more among the living let him attain what age he might. Shakespeare, more discriminating than Pythagoras, distinguished seven ages in the life of man, but his division is conventional rather than scientific, and with reference to that stage which more nearly corresponds with old age he has fallen into an error, which has stamped itself upon stage representations of old age ever since his time, and so has become part of the popular conception of that period of life. As Dr. Buzzard has acutely pointed out, the alteration in the voice which he ascribes to the lean and slippered pantalo—

His big manly voice,
Turning again towards childish treble, pipes
And whistles in his sound,

is by no means a frequent concomitant of old age, and is indeed only encountered then when paralysis agitans is super-added to senile decay. Shakespeare evidently took as his model some old man of his acquaintance affected by that disease, and has by his stupendous authority imposed on us an ideal of senility that is radically wrong, for the shrill quavering voice and trembling muscles that characterise it have nothing to do with old age pure and simple—the old age that is inevitable. And so it is with many other features, and these, mostly features of a distressing character which are prominent in the picture of old age that we form in our mind's eye, and which, indeed, are in constant association with it as we see it around us. They betoken pathological changes which occur at an advanced period of life, but they are in no way essentially connected with the normal decay of man's powers. It is of course in the autumn of life that wild oats ripen and come to fruition. Then it is that the heaped up follies and prodigalities of youth and manhood weigh heavily upon the wearied pilgrim and bow down his pithless back. Then it is that conscience, when there is one, plagues, that the dregs of heredity are seen in the nigh exhausted chalice, that the overstrained machinery breaks down, and that the postponed penalties of all the physiological transgressions, great and small, which in our artificial social existence we are constantly committing must be paid. A whole host of ailments, debilities, incapacities, and disorders undoubtedly attend and embitter old age as we are familiar with it, but I wish to impress on you the truth that a large proportion of these are in, it but not of it, and that the old age that is inevitable is by no means as objectionable a state as that which is prevalent.

The fact that what we habitually regard as the infirmities and maladies of old age are not essential to it you will the more easily realise if you look at them singly and in detail, instead of in groups, as we generally meet with them and think of them; for then it will become apparent to you that there is scarcely one of them that is invariably present in old age. As a rule, the body becomes bent in old age; but we frequently meet extremely old men of an erect and martial carriage. As a rule, the skin becomes dry and wrinkled in old age, but there are many cases in which it continues smooth and soft in octogenarians, even without the assistance of any patent soap. As a rule, the teeth fall out in old age, but instances occur in which they remain sound in their sockets

after the average span of life has been exceeded. As a rule, sight and hearing are impaired in old age, but now and then venerable men and women present themselves in whom these senses retain their pristine acuteness. As a rule, memory fails in old age, but not rarely it remains vigorous and trustworthy when senility has reached its utmost limit. And if we turn from the common physiological modifications observed during old age to the pathological manifestations which are most often associated with it and peculiar to it, occurring at no other era of life, we perceive even more clearly that these are not of its essence but accidental accompaniments, attributable not to senile involution, but to degenerative influences of various kinds. Senile osteomalacia, senile gangrene, senile gout and rheumatism, senile atheroma, senile softening of the brain, and many other senile morbid conditions, although they occur only in the aged, affect but a very limited proportion of them, arise from causes operative long before old age supervened, and must not be confounded with old age itself. Old age may run its course to the century goal without being complicated by any of these senile infirmities enumerated ; and to think of it thus stripped of adventitious misfortunes is to recognise it as a less formidable and deplorable phase of existence than we have been accustomed to suppose it to be. Of course, old age as we actually know it, as it abounds around us, is for the most part "wedded to calamity" and dowered with weakness ; but my object is to convince you of the possibility of a typical old age free from all these—along drawn out euthanasia, a simple retrogression.

Shakespeare never reached old age, as measured by years—he died at 53 ; but with the impatience of genius, he lived the whole life of man in half the allotted time, and shows us in his writings, in due order, in rich luxuriance, in perfect proportion, the whole produce of which the best English brain is capable ; and it is therefore with consolation and encouragement that we find in the last period of his literary activity, the period corresponding with old age in the average man, when bodily infirmity had probably overtaken him (for why else did he suddenly retire to the country when at the height of his reputation, and making money ?)—it is with consolation and encouragement that we find at this period a new evolution of his powers, higher than anything before manifested. *Cymbeline*, *The Tempest*, and *The Winter's Tale*, the fourth period plays, written when Shakespeare was 47 or

48 years of age, do not exhibit the subtlety and strength, the dark speculation and majestic reflection, the passionate depth and prodigality of diction of the great tragedies of the third period—*Hamlet*, *Othello*, *Macbeth*, *Lear*, *Julius Cæsar*, and *Antony* and *Cleopatra*, written from two to ten years sooner, but they mark a transition from anger and conflict to reconciliation and peace. "In these fourth period plays," says Professor Dowden, "Shakespeare had attained an altitude from which he saw human life in a clear and solemn vision, looking down through a pellucid atmosphere on human joys and sorrows with a certain aloofness or disengagement, yet at the same time with a tender and pathetic interest.....The writer of these exquisite plays has none of the lightness of heart which is the property of youth ; he knows the wrongs of life ; he sees the errors of men, but he seems to have found a resting place in faith, hope, and charity. The dissonances are resolved into harmony, the spirit of the plays is one of large benignity ; they tell of the blessedness of forgiveness, they show how broken bonds may be repaired and reunited ; each play closes with a victory of love."

The imitation of Shakespeare would not be an adequate or feasible ideal to place before mankind in these days ; but no better pattern of the temper, spirit, and piety that ought to preside in life's closing scenes can possibly be presented than that set up in the romantic comedies of the fourth period. We toil and moil through four-fifths of life with our eyes fixed on the last act—a short span of gilded dotage, an almshouse, a pension, or a peerage. Would it not be wiser to hold in view a crowning evolution of our qualities, a choice abstract of our experiences, a sublime crisis in which, although natural force is abated and the physical powers flag, the moral nature disentangling itself from selfish ties and the thralldom of passion, rises to serene heights of virtue, where love drives out fear, and faith, strengthened by suffering, reigns supreme over all ?

And such an old age is not an idle dream. Cicero looked at old age from the standpoint of self-assertion rather than from that of self-sacrifice. His ideal old man was an august Roman patrician, crowned with the laurels of the victor, powerful in the counsels of the State stern and rigorous, still capable of new acquirements. like Cato the Censor, at 84. But even Cicero has left us softer pictures of the epoch—as in that of Appius, old and blind, but revered and beloved, and

animated by the fervour of youth—and has described it as a time that may be easy and delightful, in which, after a long voyage, sight of land is obtained, and the heart discharges itself of petty rancour. We with our horizon wider than that of Cicero, are able to see in old age, even in humble life, blessings and alleviations that were beyond his ken, and obtain at least glimpses of the truth that its chief glory consists, not in the remembrance of feats of prowess or in the egotistic exercise of power, but in the conquest of peevish weakness, in the brightness of hope, and in the dissemination of happiness around. Depend upon it the best antiseptic against senile decay is an active interest in human affairs, and that those keep young longest who love most. It is a cogent argument against celibacy that it can hardly hope in its isolation to enjoy a green old age, lacking as it does those vernal influences in which parents renew their youth—

And when with envy time, transported
 Shall think to rob us of our joys,
 You'll in your girls again be courted
 And I go a-wooing in my boys.

Our own profession—the medical profession—can supply some admirable studies of old age as it ought to be, “a lusty winter, frosty, but kindly,” “I witnessed,” wrote the late Dr. Parkes, “a beautiful old age in Sir James Clark, physician to Her Majesty the Queen, a man of singular moral power and of very balanced and even mind; in character most lovable—the incarnation of beneficence and affection. He lived till nearly 80, and was active and useful to the last.” The Autocrat of the Breakfast Table, Dr. Oliver Wendell Holmes—genial and witty as ever, and now engaged on a preface to a new edition of his works—celebrated his 82nd birthday on August 29th last, and then said: “It is a surprise when we find ourselves growing old; it always comes on us as a shock when we discover that others regard us as old. Life seems more and more like a dream as one reaches old age. I am well and very happy. My eyesight troubles me somewhat, but I have no other physical ailment.” And, among the rank and file of our profession, there are countless examples of men unknown to fame, who, with ripe knowledge and quiet devotion, ply their calling and are looked up to in their neighbourhood when past three score and ten—men of the stamp of Dr. Welsh, of Haddington, of whom we should

never have heard had not Carlyle married his daughter, but of whom Edward Irving said: "He was one of the wisest, truest, and most dignified of men." I have often thought that Gray's *Elegy* was defective in having no verse commemorative of the sequestered and unsophisticated philanthropy of the village doctor.

TO PRESERVE OXYPHOSPHATE FILLINGS.

A few weeks ago, Dr. Bonwill made the statement that he had discovered the means of entirely preventing the decomposition of oxyphosphate of zinc fillings by thoroughly saturating them with heated paraffine, which melts at much lower temperature than wax. I have not tested it conclusively, but I think the idea is a very valuable one. I had occasion to put in some of these fillings some time ago, in teeth the pulps of which are very nearly exposed, and I thought it a good opportunity to make a trial of paraffine as suggested. I shall continue the test, and watch carefully the conditions. Dr. Bonwill claimed to get very good results from its use, saying that it renders the surface of the filling and interstices around it impervious to the action of acids.—Dr. G. EVANS, 1st *Dist. So., Cosmos*.

Dental News.

CHARING CROSS HOSPITAL MEDICAL SCHOOL.

The entrance scholarship, value 100 guineas, has been awarded to Mr. J. R. Langley, and that of 50 guineas to Mr. Howard Green.

APPOINTMENT.

Mr. John Humphreys, L.D.S., has been appointed Honorary Secretary to the Dental Faculty of Queen's College, Birmingham.

VACANCY.

National Dental Hospital. The post of House Surgeon will become vacant November 2nd. Applications to be made to the Secretary.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

BROMIDE OF ETHYL ($C_2 H_5 Br$) ETHER BROMHYDRIQUE) *versus* NITROUS OXIDE.

To the "Editor of the British Journal of Dental Science."

SIR,—In view of the great amount of suffering that may be prevented, especially in places where nitrous oxide is difficult to obtain, I send you this communication intending later on to ask you to publish the result of some experiments upon animals, and more detailed remarks upon its action on the human economy.

I have been using Bromide of Ethyl $C_2 H_5 Br$, but as an anæsthetic of operations of short duration and as a prelude in the administration of Ether or Chloroform in the same way as we use Nitrous Oxide in the London Hospitals.

As an anæsthetic for dental purposes it is very taking being so quick in its action and easy to administer. I find that from 15 to 30 grammes according to age sprinkled upon the flannel of a wire chloroform inhaler induces a period of insensibility sufficient for most dental requirements. The inhaler and lower part of the patient's face should be enveloped in a napkin so as to let as little air as possible enter and dilute the vapour. Thus given in a concentrated form insensibility is induced and perhaps it is best not to permit more than one or two stertors to occur before removing the inhaler.

Since the drug does not augment the pulse rate or cause cyanosis the aspect of the patient is not likely to alarm those present as in the case when nitrous oxide is being given, occasionally there is some excitement but usually the sleep is rapidly produced and tranquil, and the return to consciousness is generally sudden and complete.

Seeing that the number of operations performed during the administration of Bromide of Ethyl must now be very large, we should not let some reported accidents prevent our using it, for no doubt the cases that gave rise to these reports were brought about by the use of an impure preparation. I feel sure that pure freshly made Bromide of Ethyl in skilled hands is a safe and valuable anæsthetic.

Locally its action resembles that of the Chloride so that if it touch the tongue or lips it freezes them and causes an unpleasant feeling for some half hour or so, otherwise after effects are not troublesome, though vomiting may occur.

Yours truly,

G. COCKBURN SMITH.

British Journal of Dental Science.

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PRESIDENTIAL ADDRESS, MANCHESTER ODONTOLOGICAL SOCIETY.

By I, RENSHAW. L.D.S.

GENTLEMEN,—I desire to express to you my thanks for the great honour you have done me in electing me your President for the current year. I feel the honour all the more as I am the youngest member upon whom the honour has been conferred, and further, that it is the first time the office has been held by a member residing outside Manchester.

In accepting the position, I do so with a great amount of trepidation, as I feel it to be no sinecure to follow so able and honoured a President as our esteemed friend, Mr. Henry Campion, but having the assurance that every assistance will be accorded me by the Council during my year of office, and knowing that you will generously bear with my shortcomings, I shall exert every effort to perform the duties you have imposed upon me, and trust that I may succeed to your satisfaction.

The Manchester Odontological Society, though not very old, may be said to have passed through its infancy, and is undoubtedly shewing signs of vitality and usefulness, and will, I firmly believe, be the means of stimulating a much better condition of professional feeling in Manchester and the surrounding districts ; and not only so, but it will be the means of continuing the education of those of our members who have only recently left our schools, and giving to our older members, wider ranges of thought and more perfect principles of practice, in all that pertains to the multifarious requirements of our profession than they could possibly obtain in careless, indifferent, selfish, self-satisfied isolation.

The objects of our Society are the diffusion of knowledge, the promotion of intercourse amongst Dentists, and the advancement of the general interests of the Dental Profession. And though we are supposed to eschew dental politics and confine ourselves to the educational and scientific advancement of our members, there can be no doubt that every paper read, and every discussion which follows, will have the effect, in some way, of influencing the dental politics of the future.

The social and educational advantages which we now enjoy have not come upon us suddenly, but are the result of patient, persistent, self-sacrificing effort, a determination to surmount all obstacles in order to elevate our calling to the dignity of a profession which should have the recognition and protection of the state. Indeed, the conditions under which our young men now commence their professional career, and the facilities they have for acquiring a knowledge of it, are widely different from the conditions which obtained when I commenced practice 20 years ago. Our elders have broken up the fallow ground and sown the seed, and it remains for us and our sons to enjoy the fruit of their labours; and whilst we recognize our obligations to them, we should also recognize our obligation to posterity, by continuing to carry on the good work which they but commenced,

One of our past presidents, Mr. Dreschfeld, in his inaugural address, gave us a very interesting history of Dentistry in the past ages, and it may be interesting and instructive to our younger members if I refer briefly to Dentistry in the immediate past, its present condition, and future capabilities.

In the early part of the eighteenth century, Dentistry had become recognized as a very useful calling, but the dentist of that period was looked upon much in the same way as the Chiropodist and bone-setter of to-day, and as the necessity for Dental operations increased, and as the knowledge that these operations were being performed became diffused, it offered a splendid opportunity to all classes and conditions of men to embrace dentistry as an adjunct to some other business, and as a result empiricism and charlatanism became rampant. As an illustration, I will read what I believe to be one of the oldest Dental advertisements—it is preceded by a Medical advertisement—copied from "Riders" (1718) British Merlin: adorn'd with many Delightful Varieties and Useful Verities, Fitted to the Longitude and Latitude of all Capacities within the Islands of Great Britain and Ireland, and Chronological Observations of

Principal Notes to this year 1718. It being the second after the Bissextile or Leap Year with Notes of Husbandry and Physick, Fairs and Marts, also Directions and Tables to all Necessary Uses. By Cardanus Riders, London. Printed by Eliz. Nutt, for the Company of Stationers, 1718."

ADVERTISEMENTS.

SQUIRE'S GRAND ELIXIR, or the Great Restorative of the World, so much on the Wings of Fame for Consumptions, Fresh Colds, Coughs, Intermitting, Anguish Fevers, Pleurisies, Measles, Small-pox, all Pains in the Limbs or Joints, all Fluxes, inward Bleedings, &c., and gives present Ease in the most violent Fits of Gout, Rheumatism, Stone or Gravel; and in all sorts of Cholics, Faintings, and Decay of Spirits, easeth all grinding After-pains, and prevents Miscarriages to a Wonder.

Prepared and sold by Joseph Bawler, Apothecary, in Jewen Street, London, and is sold for him in most of the principal cities and great towns in Great Britain and Ireland, and West Indies.

NOTE.—Where 'tis not yet Sold, any credible Person who sends first may have it to sell again with good Allowance. Ready money is expected of Strangers, especially for the first Parcel.

ARTIFICIAL TEETH set in so well as to eat with them, and not to be discovered from Natural, nor to be taken out at Night, as is by some falsely suggested, but may be worn Years together. They are an Ornament to the Mouth, and help the Speech. Also Teeth cleaned and drawn by John Watts, Operator, who applies himself wholly to the said business, and lives in Racquet Court, Fleet Street, in London."

The Odontological Society of Great Britain has in its possession a curious old signboard which gives the following information :

"Thos. Smith, Glazier, Let Blood and Draw Teeth att 3 Tea Kittles and Potts, Buckels Lantrens Cups to be Handled Heare," and it is unfortunate that we have not precise date of it. These are characteristic evidences of the evolution of our profession.

In the early part of the present century, a much better condition of things existed, educated men recognised in Dentistry a splendid field for usefulness and research, and also a short way to fortune. Skilled artificers also found it a calling peculiarly adapted to their manipulative ingenuity, indeed the specimens which we have of Dental appliances which were manufactured under the peculiar difficulties and disadvantages of that period, are wonderful examples of patience, perseverance and skill, any which compare very favourably with the manipulative skill of the Dental mechanic of to-day

though surrounded by such improved facilities, and with tools which come ready made to his hands

The condition of the Dentist of that period was a condition of professional isolation and ostracism, it was a condition of suspicion and jealousy. Professional secrets and methods of practice were most carefully guarded, there was no Dental literature, there were very few text books by which the practitioner might improve his limited store of knowledge, and he had no facilities for holding intercourse with his professional brethren, but every man was content to live, move, and have his being, in a little world of his own.

These were dark days, of the density of which we can only form a poor conception

From a perusal of Hill's book on Reform in the Dental Profession, I find that the first attempt to improve the condition of things was made in 1841, when a pamphlet was issued by G. Waite, M.R.C.S., who practised dentistry entitled:—"An Appeal to Parliament, the Medical Profession, and the Public, on the present state of Dental Surgery. He depicted the anomalous condition of Dentistry at that time, and propounded a scheme whereby Dentistry should be legally recognized as a branch of the Medical Profession, that all engaged in it should have a special Medical training, and that fitness of practise should be shown before a board of Examiners of the Royal College of Surgeons, and also that none should be allowed to practise unless they fully satisfied the requirements of that board.

This appeal did not meet with any encouragement from the Medical Profession and as there was no concerted co-operation by the Dentists themselves, it fell to the ground.

Its failure, however, seemed to wake up several members of the profession to the idea that much might be done to improve the condition of affairs by united effort, and in 1842, an attempt was made to establish a Dental Society in London, but so much apathy and indifference prevailed, that this also had to be abandoned.

In the early part of 1843, Parliament had under consideration, an Amended Medical Bill, and this seemed a favourable opportunity for having a clause inserted by which the Dental Profession should be recognized by, and affiliated with the Royal College of Surgeons.

Meetings of influential and prominent members of the profession were held, and strenuous efforts were made to accom-

plish the purpose. Deputations were appointed to wait upon the President of the College of Surgeons, to urge that body to embody in its Bill Clauses which would give to Dentistry educational and protective facilities. The Secretary of State was also memorialized that he might be induced to give to the scheme his favourable consideration and support, and when we consider the fact that the names of such men as Edwin Saunders, John Tomes, Samuel Cartwright, Arnold Rogers, and a number of others were identified with this movement, men who were distinguished by their learning and scientific attainments, it is a matter of surprise that their efforts only met with discouragement, disappointment and failure.

This result seemed to indicate the utter hopelessness of looking to the College of Surgeons for recognition as a branch of Surgery, or for assistance in obtaining educational facilities, or in carrying out much needed reforms; consequently the promoters of the movement were disheartened, and for a number of years no other action was taken; but in the middle of 1856 there was a turn in the tide of professional energy which manifested itself in the attempt to establish a College of Dentists which should be separate and distinct from the Royal College of Surgeons. The scheme was originated by Mr. S. Lee Rymer, of Croydon, and a number of Dentists of repute were induced to take part in it. A public meeting of dentists was held in London, on November 11th, 1856, and attended by a large number who were anxious to ameliorate their condition, and to provide educational and protective advantages for the future. At this meeting it was decided to push forward the movement and subsequently a curriculum was framed, and lecturers, and examiners were appointed. Many eminent London practitioners were hostile to the movement, as they were of the opinion that the establishment of a College of Dentists separate from and independent of the Royal College of Surgeons, would not permanently enhance the interests of the profession, and in order to weaken and stultify the College movement, a meeting was hastily and quietly convened the day before the date of the meeting arranged by the promoters of the College scheme, when it was decided to form a scientific society under the name of the Odontological Society of Great Britain.

Both societies had for their object the elevation of the dental profession. Both had the same purpose in view, viz :—The

obtaining of a charter from the state by which a prescribed course of professional education should be recognized, entitling those dentists who were able to satisfy the examiners as to their fitness to practise Dentistry, to a diploma which should be a Diploma in Dental Surgery.

The Odontological party were anxious that a Dental education should be obtained through the College of Surgeons and that a Diploma in Dental Surgery should be issued by that body. And as a means to this end, a Dental Hospital and a School of Dental Surgery was established in Soho Square and a curriculum was agreed upon, which only required the co-operation of, and adoption by the Royal College of Surgeons.

On the other hand the Metropolitan School of Dental Surgery was opened in October, 1859, and in November, 1861, the National Dental Hospital was established under the auspices of the College of Dentists.

I need not refer to the strenuous efforts made by both parties to obtain their objects, nor to the futile efforts to amalgamate both; both sides bid very high for popularity, and it was a neck and neck race with strength and influence. The struggle ended in favour of the Odontological Society, on the 6th July, 1859, by the insertion of a clause in the Medical Practitioners' Bill, giving power to the Royal College of Surgeons, to hold examinations and to grant diplomas in Dental Surgery.

This satisfactory result may be said to have been attained by the healthy opposition of contending forces, as without it, the former condition of apathy, indifference and inaction might have again overtaken those who so valiantly fought for their convictions.

One result of the contention was that two Dental Journals were started, viz : the British Journal of Dental Science, published monthly, which represented the views of the Odontological party, and the Quarterly Dental Review, which took sides with the promoters of the College of Dentists.

The success of the Odontological Society was a severe blow to the College party, but they were not entirely disorganized, but urged their claims and pushed forward their scheme for legal incorporation with pertinacity and zeal until 1863, when after repeated disappointments and much opposition, finding that they were not likely to gain what they desired, they gave up the struggle, amalgamated with the Odontological Society, and the College of Dentists ceased to be.

When the machinery for holding examinations in Dentistry been had got into working order, inducements were held out to Dental practitioners of respectability to offer themselves as candidates (*sine curriculo*) for examination for the Dental license, a privilege which many availed themselves of.

One of the conditions required of candidates, was, that they had not advertised their profession at any time. This condition was ironical and unjust, for whilst it debarred men, who had advertised at any period, however remotely, from going up for examination, there was no restriction or penalty imposed upon offenders in this respect, *after* they became possessed of the qualification.

It is gratifying to find that the struggle which had taken place in London, and which terminated so satisfactorily, exerted a benign influence throughout the whole country. Men realized the fact that there were brighter days in store for Dentistry, and that there was something tangible to hope for and to work for. As a result, Dentistry began to assert itself by the establishment of Charitable and Educational Institutions.

In 1860, the London School of Dental Surgery was founded; and in the same year the Dental Hospital of Edinburgh was established; in 1861, Dental Hospitals were established in Liverpool and in Plymouth, and subsequently one at Exeter. The Odonto-Chirurgical Society was founded in 1867, and in 1868, a Dental Hospital was established in Birmingham.

These are evidences of the widening influence and the growing importance of the profession and the consolidation of its members.

There is, however, another and a darker picture, namely, the rapid influx into the practice of Dentistry of all sorts and conditions of men. In my own experience, I have known of men representing themselves to the public as Dentists who formerly were engaged in the following occupations:—Architect, Banker's Clerk, Bricklayer, Black Pudding Maker, Carpenter, Coach Painter, Coachman, Cotton Operative, Collier, Fishmonger, General Dealer, Herbalist, Mechanic, Milkman, Publican, Station Master, Stone Mason, Tobacco-nist and Watchmaker.

These parasitical attachments became very obnoxious to the reputable members of our calling, so much so, that in November, 1870, Mr. C. J. Fox read a paper before the Odontolo-

gical Society, "On the Position of Dental Surgery as a Profession," in which he said :—

"The great question is how the present sad state of affairs can be altered ; and I believe the universal reply, from the highest authority in the profession to the latest example of a mushroom dentist will be by Registration and Compulsory Education." There was no discussion following the reading of the paper, and the members of the profession did not possess sufficient spirit to take up the matter in earnest, and for five years it remained in abeyance, when an editorial article appeared in the *British Journal of Dental Science* for June, 1875 re-opening the question ; this was followed in July by a letter from Mr. J. Dennant, of Brighton, in which he advocated the consideration of the subject, and offering to subscribe £5 5s. towards expenses incurred in agitating the question.

But it is to our old and honoured friend, Mr. Sidney Wormald, of Stockport, that our thanks are due, as, on his own responsibility he issued circulars convening a meeting of Dentists to be held in Manchester on the 31st August, 1875, "to consider what course should be adopted to endeavour to alter the present position of Dental Surgery in this country." This circular was responded to very numerously, about 80 Dentists being present at the meeting, thus showing decisively that the time had arrived for determined action to be taken. The meeting was presided over by Mr. C. J. Fox, Editor, B.J.D.S., and was addressed by Messrs. S. Wormald, Stockport; J. Dennant, Brighton; D. A. Wormald, Bury; J. C. Crapper, Hanley; J. O'Duffy, Dublin; Dr. Waite, Liverpool; F. A. Huet, Manchester; R. Stewart, Liverpool; J. H. Kyan, Preston; and others. It was resolved :—"That it is desirable that a Committee be formed to see what steps can be taken to arrest the continual influx into the profession of illegitimate practitioners, by the adoption of the principles of registration and compulsory education." Another resolution was :—"That a subscription list be opened to defray the expenses of such a committee in making an appeal to Parliament next session, if possible, on this subject."

Acting on the principle of striking while the iron is hot, a subscription list was started in the room, which resulted in the sum of £200 being promised. The popularity of the movement became assured by its principles being adopted by the leading practitioners of the day, who gave it their hearty support. Thus the Dental Reform movement was started,

with Sir John (then Mr.) Tomes, Sir Edwin Saunders, James Smith Turner, James Parkinson, and a host of others at its head, to help it forward and direct its course. And such was the energy and skill manifested, that in three years from the date of the Manchester meeting the legislature gave us an Act of Parliament to regulate the practise of Dentistry, and to make registration and a professional education compulsory.

In February, 1877, there was another large gathering of Dentists in Manchester to advocate an appeal to the "executive committee of the Dental Reform movement, to embody in their scheme of Dental Reform, a reopening of the L.D.S. examination to all existing practitioners without curriculum, and with a form of examination modified according to the number of years candidates may have been in practice."

A committee was formed, consisting of S. Wormald, Stockport; W. H. Waite, Liverpool; John O' Duffy, Dublin; John Laws, Bolton; and Richard Rogers, Cheltenham, and several others, to adopt measures to further the resolution of the meeting and to endeavour to accomplish its purpose. This committee finding that it was hopeless looking to the English College for any further concessions, resolved to appeal to the Royal College of Surgeons in Ireland, which resulted in that Body consenting to appoint a Court of Dental Examiners as soon as the Dental Bill became law, which contained clauses empowering the various Medical licensing bodies to hold examinations and to grant diplomas in Dental Surgery. It agreed to hold examinations *sine curriculo*, and to grant the License of the College, to those applicants who satisfied the Court as to their professional knowledge and fitness. The action of the Irish College was speedily followed by the College of Surgeons of Edinburgh and the Faculty of Physicians and Surgeons of Glasgow.

Since the passing of the Dentists' Act on the 22nd July, 1878, remarkable strides have been made in the profession. The aim of the Dental Reform Committee having been accomplished it was disbanded, and immediately re-organized, under the name of the British Dental Association, having for its objects—The promotion of Dental and the allied sciences, and the Maintenance of the honour and interests of the Dental profession, by periodical meetings of its members and the profession generally, in different parts of the country;

and the Maintenance of the spirit and provisions of the Dentists' Act.

The present condition of Dentistry in this country is a remarkable example of what may be accomplished by unity of purpose and concentration of effort. No better proof need be given than the fact that nearly every large Infirmary and charitable Institution in the kingdom has its Dental Surgeon. We have now the following Dental educational institutions :—

The Dental Hospital, London, and London School of Dental Surgery.

The National Dental Hospital and College.

The Dental Hospital and School, Edinburgh.

The Dental Hospital and School, Glasgow.

Birmingham School of Dentistry, Queen's College, Birmingham.

Birmingham Dental Hospital and School.

The Dental Hospital of Ireland.

The Victoria Dental Hospital of Manchester.

The Dental Department, Owen's College, Manchester.

The Liverpool Dental Hospital and School.

The Dental Hospital and School, Plymouth.

The Exeter Dental Hospital.

The following General Hospitals have their Dental Departments:—Charing Cross Hospital; London Hospital and Medical College ; King's College, Strand ; Middlesex Hospital; St. George's Hospital; St. Bartholomew's Hospital St. Mary's Hospital St. Thomas's Hospital; Westminster Hospital; School of Medicine, Surgeons' Hall, Edinburgh; Guy's Hospital.

Several of these Institutions have their separate Dental Students' Societies.

Dental Scientific Societies—The Odontological Society of Great Britain ; The Odonto-Chirurgical Society of Scotland ; The British Dental Association, with its 9 branches ; and lastly, The Manchester Odontological Society.

Much has been done in the way of scientific research, which has added much to our knowledge of professional subjects and principles of practise.

We owe a debt of gratitude to those who laboured so long and so earnestly to elevate our calling to the dignity of an honourable profession ; “they rest from their labours, but heir works do fellow them.”

It would be difficult to find a profession which has risen to such importance in so short a time, and which may be described as a position of dignity and usefulness ; but, I would remind our young men that they must not consider that there is nothing more to work for, or to strive after; the possibilities of the future are great, the issues of which are in their hands.

With an improved Dental literature, a multiplicity of text books, and with such an army of experienced teachers they will have only themselves to blame if they do not earn for themselves reputations as honourable, and names as distinguished as any which have preceded them.

As a means to this end, I would strongly urge their attention to clinical demonstrations, investigating causes of decay of the teeth, with a view to the prevention of the same, overcrowding, bacteriology in the mouth, and the health of the mother during pregnancy. A consideration of the teeth of artisans and operatives, and how effected by their occupation and environments, such as workers in chemical manufactories, match works, cotton mills, salt works, and lime burning, &c.

The recent report of the Committee appointed by the British Dental Association, to obtain statistics of the condition of the teeth of school children reveals an alarming condition of things, and it appeals to our efforts to devise means whereby such an amount of suffering and decay may be prevented. There is, therefore, no excuse for us to hang down our hands, and say there is nothing for us to do, waiting Micawber like, for something to turn up.

Let us, therefore, be up and doing, seeking for opportunities for usefulness, with a determination to leave the profession better than we found it.

The time may not be far distant when Dental Charlatanism shall have ceased, when the public shall more fully recognize the importance of Conservative Dentistry. When principles of Dental Hygiene shall be taught in our public schools, when compulsory attention shall be given to the teeth of school children by a paid dentist, and when the teeth of our soldiers and sailors shall receive such professional attention, at the expense of the State, which their importance demand.

Gentlemen, I thank you for the patience with which you have listened to me; I had not intended taking up so much of your time, but I found the subject growing upon me, and the time at my disposal was too short to change my subject.

SOME OBSERVATIONS ON THE PHYSIOLOGY AND SEAT OF PAIN.*

By THOMAS GADDES, M.D., L.D.S. Eng. & Edin. etc.

It may be said without fear of controversy, that no one of the sciences upon which Medicine is founded, has advanced more within recent years than physiology has done. And perhaps the physiology of the nervous system, considering its supreme complexity and the difficulties attending its pursuit, stands out not the least prominent with its luminous strata unearthed by modern discovery. Of the greatest importance to the practice of medicine and surgery is a knowledge of blood pressure in the systemic circulation, as controlled through the influence of the vaso-motor nerves upon the small arteries and veins. And the latest induction in this relation, is the existence of a similar vaso-motor, or controlling function presiding over the pulmonary system of blood vessels. Almost incalculable, also, is the value of the physiological data spoken of as cerebral localisation—that is, the knowledge of the definite situations upon the surface, or grey matter of the cerebrum, which are the nerve centres controlling, through the mind, certain muscles and groups of muscles, as those of speech, of facial expression, of the arm, of the leg, &c. How those centres, like electric batteries, are connected with one another; that they have a certain resistance to discharge; that their stored up energy may be caused to overflow to other centres or cells; that these centres, situate high up on the brain, are connected with others at lower levels and less associated with psychical influence; that the higher centres can be inhibited, restrained or switched out of connection with one another and with lower centres, as in hypnotism, and so on. Consequent upon those increments to knowledge, many of the explanations of perverted or diseased action have to be remodelled, not upon the old lines simply, but, in many instances, upon a totally different foundation.

This reformation necessarily relates to the Dentist as well as to the Surgeon and to the practitioner of Medicine, each having the science of physiology for a partial, yet most important basis of his sphere of action.

* A paper read before the Student's Society, National Dental Hospital.

Let me now preface what ensues with the following anatomical facts : A nerve fibril between its peripheral and its central terminations is not branched, nor does it communicate. The fibres forming several nerve trunks may be rearranged, as in a plexus, but the individual and ultimate fibril of an axis cylinder does not branch. Any branching of the ultimate fibre is probably limited to its a entral and peripheral endings.

These anatomical facts enable us to affirm that ordinary impulses travelling a given nerve fibril from its periphery to its centre always, in the normal condition, arrive at a certain cell, and by such action, repeated myriads of times through countless ancestors, a definite cell area becomes the associated centre of a definite fibril. So that on just sufficiently exciting one such area, or the fibril leading to it, there arise in consciousness those phenomena of sensation, and of location, similarly as when the periphery itself were the seat of stimulation. Familiar example of this latter is the pain referred to the third and fourth fingers on striking the ulnar nerve, or "funny bone," at the elbow, also the pain in the toes of an amputated leg. On the other hand, an irritation of a certain area of the brain, as by a tumour, a splinter of bone, or electricity, gives rise to similar sensory or motor disturbances. But let the excitation of the centre be too great, or the centre itself be surcharged, as it were, and then the impulse overflows to other cells and excites them. Thus sensation of pain is referred to quite different regions from that which is the seat of stimulation. Witness, for instance, disease confined to one tooth giving rise to pain in several teeth; a diseased lower molar causing earache, congestion of the liver manifesting pain in the inter-scapular region. Or, instead of overflowing to contiguous sensory cells, motor areas may be excited, resulting in muscular twitchings, clonic and tonic contractions, and even epileptic seizures.

Here, on passing, let me mention, as a reminder, that sensation, or the reception into consciousness of sensory impulses, is the function of nerve cells. Therefore, pain as a form of sensation is not situate at the periphery, as in a diseased canine tooth, but, necessarily, in a nerve centre. How can the pain which the patient "feels" in the toes of amputated foot have its seat in these defunct, and perhaps buried, members? In strict interpretation of the phenomenon, I do not "feel" pain in an inflamed pulp; but that sensation in consciousness, which I interpret as pain, I refer to.

the seat of inflammation ; or refer to the last toe as being the wonted termination of the divided nerve fibril in the stump ; or refer to other teeth, or to the ear, in the case of overflow to the neighbouring central cells which supply those sound teeth, and the external auditory meatus respectively.

We are now in a position to examine according to this "newer" light some explanations of pain and perverted function that are given in a few of the older editions of valuable books. For this purpose I shall direct attention to one of the most important books contained in the Library of this Society, namely :—Hilton's "Rest and Pain," 3rd edition, a work which every member should read, I would even say possess.

In discussing what are termed "sympathetic" pains, Mr. Hilton, at p. 71, last line, says : I would ask you to regard them as resulting from some direct nervous *communication* passing between the part where the pains are expressed and the real and remotely situated cause of the pain," and at p. 72, line 17, "which result from a *continuity* of nerves between the cause and the effect, the disease and the symptom." Again, at p. 223, this idea of communication of nerve fibrils is mentioned thus :—"If we find an inflamed tooth in the second division of the fifth nerve can produce irritation of the tongue, and cause it to be furred, surely it is not forcing the principles of anatomy and physiology to say that the obturator nerve, being involved in mischief in the hip joint, may, by continuity, convey irritation to the surface of the skin on the inner side of the knee, and also to the interior of the knee-joint." Other instances might be quoted, as at p. 84, last sentence ; p. 90, last sentence, and page 78, which all indicate the existence of an intercommunication of nerve fibrils during their course from the nerve-centre. That, I need not remind you, is not in accord with the histology of to-day. Indeed the editor (Mr. Jacobson), in his notes to the 3rd edition, quotes, at p. 78, the following remark of Dr. C. Fox, published in an article in the *Lancet* in 1866 :—"This sympathy is an example of a reflected sensation, in which the connection between the nerves concerned takes place in the nervous centre." Cases occasionally occur where a cough is solely dependent on some source of irritation in the auditory canal." Here Mr. Toynbee is quoted as saying that the impression produced by irritation of the auditory canal in these cases is probably conveyed by the auriculo-temporal nerve to

the deep origin of the sensory root of the 5th, which is in close proximity to the deep origin of the vagus in the floor of the 4th, ventricle. Here a change is in all probability effected in the grey matter, which results in the stimulation of the vagus. The irritation is referred to the larynx because the medulla oblongata is wont to receive impressions from that organ through this nerve. As a consequence, the respiratory muscles are set in action to free the larynx of the supposed irritation."

Again at page 210, the editor gives an explicative extract from an article by Dr. Hart, in which the writer says:—"From the unprotected sensory filaments of the 5th in the special carious tooth, an irritation is conveyed to the centre of the 5th, causing hypercæmia in the area of that centre mapped out for the special fibrils. Pain is felt then by transmission to a higher part of the brain. The irritation of the tooth being continued, the hypercæmia relieves itself into the adjacent area of other fibrils. In this way we get pain in the adjacent teeth with perhaps relief of the pain in the original tooth, because its area has been bled, and its normal blood supply recovered. The areas for the supra-orbital and auriculo temporal nerves become next congested. These supply parts exposed to pressure and draughts, which are felt as pain when the centre for the parts has its blood supply and activity aroused."

The foregoing editorial illustrations were not contained in the first edition of "Rest and Pain," which was the one I read many years ago. Hence the necessity of correcting the data thus gathered from the text of this valuable work has prompted me to offer these observations to the Society. Therefore, the reader of the work should be careful to interpret the physiological explanations given in the text by the light of the Editor's notes and the data I have mentioned.

The right understanding of the course pursued by nervous impulses in cases of so-called "sympathetic," diffused or radiated pains is essential to scientific treatment. The more we raise our methods of procedure from the empiricism of nescience to the platform of knowledge, ever and anon examining and fortifying our position, the better we serve the public, serve, honour, and obey the higher aspirations of our manhood.

From the senior and more advanced members of the

Society, I crave indulgence for the commonplace facts and remarks contained in this short communication. And to the members present this evening I would apologise for presenting to them a paper which is rather didactic, than one likely to give rise to lively discussion.

THE BREAKING OF PORCELAIN

Is urged as an objection to this work in bridges. This can be entirely obviated, and without the display of gold often seen on side bridges. After the porcelains have been ground into position and backed up, bevel the cutting edges as much as possible without changing the form, even if it be a cuspid or bicuspid face, and wax carefully on the bevel a piece of crown metal, No. 25 to 27, according to the strain, taking care to keep the wax from the joint, and allowing the metal to extend beyond the tooth, so as to be held firmly in position by the investment when the wax is removed, and while soldering. If the cutting edge of the incisors occlude, flatten and bevel slightly. When finely finished, the protection will not be observed, and I have yet to see the first case of breakage in an extensive use of this simple device. In protecting bicuspid and molar faces, the protection must be secured in position before the masticating surfaces are fitted, which should be as near the cutting edge as the occlusion will permit. If properly finished, no gold will show, and the porcelain bevelled in this manner is thoroughly protected from strain. Avoid getting wax on the face of the metal, so that the investment may protect it from solder and the porcelain from borax checks, compelling the solder to attach underneath, so that the face will need no finishing, except to grind down the portion beyond the tooth. It will also allow of a high polish for the surface, and there will be no thinning of the protection from careless grinding, as there would be if solder were allowed to flow on the face, and the tendency to discolouration at the cutting edge will be avoided.—DR. C. L. ANDERSON.

Independent Practitioner.

British Journal of Dental Science.

LONDON, NOVEMBER 2nd, 1891.

THEORY AND PRACTICE.

IN a recent speech, an eminent statesman has urged the study of abstract subjects as against the practical. He has pointed out and bewailed the fact, that the tendency of recent times is to devote attention to practical matters, subjects which are of an utilitarian nature, whilst more philosophical matters are neglected. Now the reply :—few of us can afford to do otherwise, is at any rate sufficient explanation of a state of things we must admit to be true, but at the same time there is, no doubt, too great a tendency to neglect theoretical considerations in endeavouring to obtain practical experience. We believe that in dental matters, this is most true. Dentistry is, no doubt, essentially practical. From the very commencement of our studies, from the day when as boys we enter the workroom and commence by casting models, polishing pieces and other smaller matters, it is really the fingers which we are training. Few, far too few, trouble to look at the reasons why we do things, We do so, because they have been done before, because that is the way we have been told to do it. Why the plaster sets, why the rubber hardens, why the plate is annealed are points many of us trouble little about, till some years have passed away and we find ourselves in the class room at our schools. Probably, the mechanical assistant, could not answer these questions, and the practitioner to whom we are

nominally articulated, does little or nothing to enlighten his pupil.

Theory itself, the idea of how things are done, is of little import. The theory of to-day may be, and often is, the absurdity of to-morrow, but the facts on which the theory is built, the observations which have been made and have led to such and such a theory being built up, these are of the very first importance. As it was in the early mechanical days, so it continues through the hospital career, so it increases to be during the after years of practice. It is said that at the college examinations, few men fail in their practical work, as compared with the number who come to grief over the scientific side of their work. We must confess, we would sooner have matters so, rather than the other way round, but, at the same time, there can surely be no logical reason why this scientific side should be neglected to so considerable an extent. Undoubtedly, our system of education is, in a certain measure, at fault. Contrary to reason, contrary to that which rules in medical studies, the dental student is called upon to do practical work, before he has gained any scientific instruction whatever. It is perfectly true, that this is, to a certain extent, unavoidable, nevertheless surely some attempt should be made to obviate the difficulty, if in no other way, by a course of private reading. Here it is the duty of the practitioner to advise and help his pupil in the choice of books and in understanding difficult points. The years of pupilage should certainly not be merely years of mechanical training, nor is the duty of the master fulfilled if he allows his, or his assistants', instruction to begin and end at this point. We are not now concerned so much with the duty of the master, as with the thought that possibly some of the contempt or neglect of the theoretical side evinced by some of our students, may in a measure be due to a bad beginning, during these years of pupilage. Dentistry, as now practised, is not, it is true, an exact science, it is to a large extent empirical. That it should not be so, we grant. Someday, the why and the wherefore of all our processes may be stated, but for the present a great

deal rests on practical experience. Yet, surely this is no argument against as full and complete a knowledge of what is known. It may be impossible to state the causes of all our actions with mathematical accuracy, but that it is desirable to do so goes almost without saying. Now the only way in which we can even hope to attain to this complete knowledge, is by an intimate acquaintance with the various collateral sciences which bear on these points. Who can hope to solve the question of amalgams and other plastic filling materials, who does not know the laws of chemistry and of physics? Who can hope to explain the various morbid changes of the pulp without a knowledge of the general laws of pathology? Points like these, of which space permits us to mention but these two, seem to us to indicate pretty plainly the need there is for opening widely the subjects of study, remembering, that though there may be no apparent connection between the diseases of, and operations on the teeth, and those of other parts of the body, yet that no truly scientific work can be written on these points, unless the writer has a good general knowledge, which must have been gained by studies not confined to one limited speciality. So, if it were needed, it would be easy to draw apparently abstract studies within the utilitarian camp and to prove up to the hilt how great is the need for such work.

What is regarded by Mr. Bland Sutton as an unique case of Median Harelip was shown by Mr. Clutton at a recent meeting of the Pathological Society. The case was that of a girl, aged fifteen, who had never been submitted to any operation, having a small notch exactly in the middle line of the upper lip. The alveolus of the upper jaw immediately beneath and exactly in the middle line was also cleft. The palate was ununited from one end to the other. There were no central incisors, but there was a lateral incisor and a

canine on each side ; fifteen months before, three teeth had been extracted from the front of the jaw, the nature of which could not be ascertained. Mr. Clutton regarded this as a case in which the pre-maxilla was present but un-united, which, according to Albrecht's view, would be that the two inner centres of ossification of the pre-maxillæ were absent though the two outer remained.

The Calendar of the Royal College of Surgeons of England for the past year shows that there are 1,111 Fellows of the College, 16,622 Members, 737 Licentiates in Midwifery, and 745 Licentiates in Dental Surgery. During the year 70 Candidates were examined by the Board of Examiners in Dental Surgery, 42 of these were successful. The fees paid amounted to £441, the board receiving £294. The total income of the College amounted to £36,953 4s. 3d. the expenditure to £34,119 3s. 7d. The expenditure includes items of £9425 11s. 1d. paid for extension of College premises ; £9178 1s. fees to examiners, and £5708 13s. 11d. half expenses of Examination Hall and Laboratories. The fees paid to Council only amount to £274 1s.

The following are the entries for the Winter Session at the various schools :—

St. Bartholomew's, for the full course, 104, for special classes, 44.

Charing Cross, 73 first-year students and 7 occasional students.

Guy's, 124 students have joined.

St. Mary's, 76 first-year and 37 occasional students.

St. George's, 47 first-year and 1 occasional.

St. Thomas's, 83 first-year students, 24 for special courses, and 13 for the preliminary scientific examination.

London, 37 for the full curriculum, and 45 occasional students.

Middlesex, 71 for full curriculum, and 59 occasional students.

King's College, 35 for the full curriculum, 14 for the preliminary scientific, and 63 occasional students.

Westminster, 25 first-year's and 2 occasional students.

London School of Dental Surgery, 26 have joined for the whole curriculum, and 3 for special courses.

Queen's College, Birmingham, 7 dental students.

Owen's College, Manchester, 8, and at

University College, Liverpool, 6 have joined.

The *American Journal of Pharmacy* gives the following formula for Goddard's astringent gargle :—

Fol. rosæ rub.,	.	.	2 dr.
Aquæ bullientis,	.	.	5 oz.
Acidi sulphurici dil.,	.	.	$\frac{1}{2}$ dr.

Infuse, when cold strain, and add—

Mel. despumati,	.	.	1 oz.
Acidi tannici,	.	.	2 scr.
Aluminis,	.	.	2 dr.
Spir. vini rectificati,	}	. aa	6 oz.—M.
Aquæ rosæ,			

Another gargle is as follows :—

Red rose petals,	.	.	2 dr.
Pomegranate rind,	.	.	4 dr.
Boiling water,	.	.	6 oz.

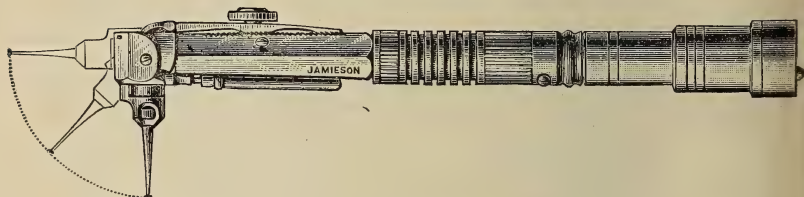
Infuse, strain, and add—

Alum,	.	.	2 dr.
Clarified honey,	.	.	1 oz.

Mix, filter.

Manipulative Miscellany.

All new instruments or articles that it is wished to have described under this heading, are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.



We have received from Messrs. W. & J. Jamieson one of their "Universal Hand-pieces," of which an illustration is given above. It is "Universal" in the sense that the end of the hand piece, which carries the bur, can be adjusted from the straight to any angle between that and a somewhat acute angle. In any position it can then be fixed by tightening a screw, turned by the milled head represented in the diagram. The use of such an instrument must be at once apparent. It saves loss of time in changing the hand-piece, and at the same time allows the handle to be fixed by the operator at that angle which is most convenient to him. We must, however, congratulate Messrs. Jamieson on the ingenuity of the instrument, and recommend our readers to try it for themselves.

Abstracts of British & Foreign Journals

MAXILLARY CYSTS CONNECTED WITH THE TEETH.

By LUDVIG HEKTOEN, A. B., M. D., Professor of Pathology in the Post-Graduate Medical School of Chicago, Lecturer on Pathology, Rush Medical College, Pathologist to Cook County Hospital.

The specimen of the comparatively rare form of neoplasm known in English and American literature as dentigerous cyst, which is about to be described, was given me for examination and diagnosis by Dr. A. B. Strong, late Attending Surgeon to the Cook County Hospital, and it is at his request that the first case is here reported in its entirety. In connection with this I desire to express my thankfulness to Dr. Strong for the opportunity to examine the growth and for the invitation to publish the case.

The clinical history of the patient from whom the tumour was removed, as well as the description of the operation as furnished by the Doctor, are briefly as follows: The patient was a man 28 years old and in good general health. When two years old he had some difficulty with a tooth on the same side of the lower jaw as the present tumour; at the age of four this tooth was extracted by a dentist. For an indefinite length of time after this there would be a periodical discharge of some kind of matter from this point in the jaw. This finally ceased, and then a gradual and painless enlargement of the left half of the lower jaw was noticed, but the growth of this enlargement was extremely slow, until three years ago, when it became more rapid, and for the last nine months the swelling has increased more rapidly than at any previous time. Patient does not seem to have had any other teeth extracted. At the present time, the left half of the lower jaw is the seat of a fluctuating tumour, which seems to spring from the interior of the bone. At the posterior part a slight crackling is noticeable on palpation. The patient cannot shut his mouth

completely, the front teeth remaining about half an inch apart.

December 20th Dr. Strong dissected the left half of the jaw, experiencing no special difficulty except that the condyle was rather hard to remove. The wound healed by primary union throughout the greatest extent, a small stitch-abscess forming in the parotid region, which had to be drained later on. At the present time, two months later, the patient is as well as could be expected and much pleased with the cosmetic effect.

The portion removed consists of the left half of the lower jaw, which has been sawn through at the symphysis and disarticulated; the soft parts have been dissected away quite thoroughly. The specimen presents a much changed appearance from that of the normal jaw

There is no sign of the coronoid process and commencing in a line with the canine tooth the body and angle are much expanded and contain many cystic cavities, only the condyle and the part anterior to the canine tooth have retained their normal size, contour and consistence. In the more detailed description it may be stated that in the alveolar border are four well preserved and apparently healthy teeth; namely, the first molar, the two bicuspid and the canine. There are no signs of the second and third molar teeth, the gingival mucous membrane bulging in all directions behind the last tooth, the first molar; the eminence thus formed rising higher than the crowns of the teeth, and would consequently prevent complete closing of the mouth. The two incisors were extracted during the operation in order to give room for the saw.

On the internal surface of the jaw, just behind the fossa for the sublingual gland, a cystic bulging commences, which extends from the canine tooth back to the molar; the walls of the cyst are formed by the bone above, in front and below, laterally and posteriorly by fibrous tissue. A small opening was made into the cyst during the operation so that it is now empty. It would hold about half an ounce of fluid. There are no teeth in the walls of the cyst, and it does not communicate with the teeth in the alveolar border of the jaw. Situated immediately behind this cavity and bulging on the external surface of the body is a second cyst of similar size unopened, filled with a viscid, clear fluid containing yellow particles: this cyst is separated from the first by a thin trans-

lucent membrane, and it replaces more of the bone externally than internally. Occupying the places of the angle and the ramus of the jaw, clear up to the neck, is a large cystic cavity which would easily contain a hen's egg. The walls of this cyst seem to consist of fibrous tissue in which are thin plates of bone that crumble with a cracking noise when pressed upon or bent; along the centre of the floor of this cyst runs a ridge which projects into the cavity of the cyst, so that a bulging takes place inferiorly on each side of the ridge; this ridge is formed of bone. It is a remnant of the interior and posterior border of the body and ramus of the jaws, and in its upper margin, directly underneath the lining of the large cyst, runs a groove which contains a nerve, presumably the inferior dental. In the external wall of this cyst are embedded two large teeth, quite well developed, with broad cubical crowns, the upper surface showing five tubercles separated from each other by more or less conical depression; each tooth has a distinct neck and one root upon which run grooves, which if carried clear through the tooth would subdivide the root into three or more fangs. Cross section of one of these teeth shows a normal pulp cavity, from which extend two small canals into the end of the composite fang, showing again that the fangs had become amalgamated into one.

Behind this large cyst, corresponding to the posterior border of the upper half of the ramus, is a smaller unopened cyst about as large as a hickory nut. Lastly, in the fibrous tissue, between the mucous membrane behind the teeth, in the alveolar border and the large cyst, are many small cystic spaces or dilatations, varying in size from a minute spot to an ordinary bean. These smaller cavities contain a grayish white viscid fluid, while the large, unopened cysts contain a viscid, clear fluid in which float glistening golden yellow particles. The walls lining the cysts are smooth, with irregular recesses, apparently dependent upon the unequal resistance offered the expanding intra-cystic pressure by the soft tissues as compared with the remnants of the bone of the jaw.

Microscopical examination of the fluid was practically negative. The glistening yellow particles were cholestearin crystals, and there were also some small granular bodies in the fluid and amorphous particles, but no typical cells of any kind. The tissue composing the walls of the cyst consists of normal, quite dense connective tissue, with few vessels, the internal surface being covered with a single layer of epithelial

cells. The tissue composing the prominence behind the teeth is quite spongy and is made up of mature fibrous tissue, enclosing small empty spaces lined with epithelial cells.

Diagnosis : Proliferating follicular dentigerous cystoma of the lower jaw.

The second case occurred in the surgical practice of Dr. C. W. Oviatt, of Oshkosh, Wis., who kindly turned the specimen over to me for description and gave me an opportunity to personally interview the patient. I am consequently very thankful to Dr. Oviatt for his kindness.

The patient was a woman, at present forty years old and in good general health. At sixteen years of age she noticed a small swelling at the site of the first wisdom tooth on the left side of the lower jaw ; this swelling was painless and of slow but gradual growth ; at seventeen years she was accidentally struck on the left half of the lower jaw, and the swelling then got "hot and inflamed" and was painful ; at twenty this swelling was incised through the mouth and the doctor had to break through the bone before he could get into any cavity ; through the opening thus made a molar tooth was removed. From this time on until she reached the age of thirty-two, when she came under Dr. Oviatt's observation, the swelling in the lower jaw would increase in size periodically and then matter would be discharged and diminution in size would follow. In the meantime all the teeth in the left side of the lower jaw were extracted, one by one, but with no effect on the suppurating swelling, which slowly increased in size and continued to suppurate, thus rendering the patient very miserable. When Dr. Oviatt saw the patient eight years ago, there was a cylindrical hard tumour which seemed to grow from the interior of the body of the jaw ; there was no cracking in the walls, no fluctuation, but there were fistulous openings in the alveolar margin at the site of the molar teeth discharging pus. The left half of the lower jaw was then excised and while sawing through the ramus the saw was broken on a tooth which lay impacted in the substance of the bone. The patient made a prompt recovery and has had no further trouble with the jaw.

The specimen, which has been kept in a dilute solution of alcohol for eight years, consists of the expanded body of the lower jaw ; it is $3\frac{1}{2}$ inches long ; irregularly circular in outline ; a little flattened from above downward, the external border convex, the internal concave ; it measures four inches

in circumference at the thickest portion. Anteriorly it is tapering toward a sharp point, being cut squarely through, and in this end it can be seen that the interior is made up of spaces ; at the posterior extremity is an opening into a large cavity and in the soft tissues surrounding this opening lies a tooth ; it is an imperfectly formed molar tooth, the crown being apparently normal but the root short and rudimentary, consisting of an amalgamated fang. There are no teeth in the alveolar border of the excised portion ; but near the posterior end of the border is a small opening which passes downward into the cavity. The external wall of the specimen consists everywhere of quite firm bone, except near the anterior end where the bone is thin as parchment but *cragment* cannot be produced. On sawing through the bony wall along the external convex margin, and opening the specimen after the manner of a tobacco box, it is seen that the interior is made up of many cavities, with quite smooth walls, of irregular size and shape, the largest being situated at the posterior end and as large as a walnut, while anteriorly are some the size of a pea ; some of these cavities do not communicate with each other and are perfectly independent ; others again do, and in the later instance anfractuossities in the walls indicate that the communication has been established by gradual atrophy of the intervening partition. The opening of the aveolar margin passes down into a large cavity. The lining of the cavities or spaces consists of soft tissue and there is very little bony substance in the partitions between the spaces, and the bone thus situated is always connected with the external wall of the cystoma. The external wall of quite uniform thickness, about one-fifth of an inch ; near the anterior end it is thin and translucent. Microscopical examination of the soft parts showed no characteristic structure, presumably on account of the specimen and the vicissitudes the preserving medium was subjected to. The diagnosis, however, seems definite enough, namely as in the first specimen ; proliferating dentigerous cystoma of the lower jaw.

ETIOLOGY.

No bone in the body is so frequently the seat of cysts as the maxillæ, and this frequency of cyst formation in this locality must be attributed to the fact that in the alveolar border of the jaws develop the teeth, and morbid changes after their maturity as well as disturbances during their development

often gives rise to the growth of cysts which in some cases may replace a large part of the bony portion of the affected jaw. Thus Koenig states that the majority of all the cysts in the maxillæ are connected with the teeth.

Magitot divided the cysts of the jaws that could be traced to have any connection with the teeth into two kinds: the periosteal and the follicular. It will be seen further on, that the follicular cysts are again divisible into simple or unilocular and proliferating or multilocular. Of the two varieties of cysts, the periosteal seems by far the more frequent. Haderup studied 64 cases of maxillary cysts in 56 patients, and of those 50 were periosteal, 10 follicular, and 4 seemed to have no connection with the teeth at all. It is, it appears, quite common experience for dental surgeons to find small cysts connected with the fangs of permanent teeth, without having caused any symptoms; at times, however these cysts grow to a considerable size and give rise to prominent swellings by absorption of the alveolus. These cysts were considered by Dupuytren to be due to disease of the root of the tooth, because the root is usually found diseased in such instances. Magitot called this variety of maxillary cysts periosteal, because he considered them due to inflammatory changes in the periosteum around the root, as a result of which fluid accumulates beneath the loosened periosteum between the apex of the root and the bottom of the alveolus. As a sequence of the pressure of the constantly increasing fluid, gradual atrophy of the bony wall of the alveolus takes place the cyst thus formed reaching in some instances a capacity of from one to three ounces. Haderup was led to believe that the periosteal cysts of Magitot are due to the development of small, soft fibromata at the root of a necrotic tooth, central softening taking place, and he calls these cysts simply teeth root cysts. Other modes of origin of the periosteal cysts have also been described. For the purposes of pathological diagnosis it is well to bear in mind that in the periosteal or teeth root cysts the root of the tooth always projects into the cavity of the cyst, the tooth being normally located.

The follicular variety of maxillary cysts are true cystomas, arising apparently on account of misplacement of a dental matrix, and subsequent impaction of a more or less full grown tooth or teeth, and in this way they consequently illustrate Cohnheim's theory of the origin of tumours. This variety of cyst is found in connection with misplaced teeth in all parts

of the maxillæ, developing at or near the places where the teeth naturally form, or it may be heterotopic, having been described according to Koenig, in the palate bone, in the orbit, and in the angles of the lower jaw. It is most frequently connected with permanent teeth, the tooth or teeth being, as in the case just described, normal in presence and serial character, but misplaced. They may, however, result from an impacted supernumerary tooth, and in one or two instances the cysts have been traced to temporary teeth. Haderup is quoted in the *Universal Annual for Medical Sciences* for 1890 (Vol. III, Section J, in the article on Oral Surgery), to the effect that follicular cysts are usually found in children in connection with the milk teeth; the statement, if it be correctly quoted, is at direct variance with the recorded observations of all other authors.

As these cysts do not form after the corresponding tooth has pierced the gum, but only while the tooth or teeth are imbedded in the bone, it will be interesting to briefly refer to the conditions which may prevent the eruption of a tooth. Salter enumerates the three following: The tooth may develop too deep in the body of the jaw and, though it grow in a right direction and in a right place as regard the series, yet it will never reach the alveolar margin; or, it may be sufficiently superficial, but taking an oblique direction of growth, it comes to lie covered more or less in the axis of the bone; or, again, the position of the tooth and its line of growth may be originally normal, but from arrest of development of the fang, it may nevertheless fail to reach the alveolar edge and so remain permanently imbedded in the substance of the maxilla. Koenig speaks of the fact that the normal eruption of a successional tooth may be impeded or prevented entirely by the refusal of the temporary tooth to give way, or by abnormalities in the jaw causing diminution in the space in the alveolar border. As already stated, the displacement of the embryonal dental matrix may be so marked as to lead to the development of teeth and cysts in the palate bone and in the orbit. It must be recollected, however, that the embedding of a tooth in the jaws or in any of the bones of the face does not necessarily result in the growth of a cyst, because such misplacement is not so very uncommon according to Salter, whereas dentigerous cysts are quite rare occurrences.

Before entering into any details concerning the development of the cyst, a brief reference to dental embryology will,

perhaps, make the subsequent statements plain. Commencing about the second month of foetal life, the dental groove forms in the gum ; this groove is soon filled with epithelial cells, and then it forms the enamel organ ; this epithelial mass constituting the enamel organ passes downward deeper into the substance of the jaw until it meets a conical papilla, the dentine germ, which grows upward from the mucous tissue of the embryonal maxilla, and over this papilla the enamel organ folds itself like a cap or capsule. As little by little the parts of the enamel organ lying between and uniting the various dentine germs disappear and gradually the connective tissue forms a sac or follicle surrounding the single papilla or dentine germ and its enamel organ. The epithelial cells of the enamel organ lying next to the dentine germ form the enamel prisms of the crown ; the external layers from the *cuticula dentis* or Nasmyth's membrane. This mode of development is the same for both temporary and permanent teeth ; during the development of the milk teeth a special enamel organ is formed near them, but it does not undergo development until the milk teeth are shed. After the eruption of a tooth the *cuticula dentis* is soon worn away from attrition against the opposite tooth as well as during mastication.

Now, according to Salter, Heath, Tomes and others, when the tooth sac is misplaced and consequently impacted, then fluid may accumulate between the cuticula dentis and the crown of the tooth distending the tooth follicle into a cyst, lined with epithelium and containing in some part of its wall, or, more rarely, free in its cavity, a more or less completely developed tooth, or even teeth. But this view does not explain the origin of those cysts which contain only irregular pieces of enamel, or no trace of mature dental tissue at all where the growth of the cyst must have commenced during the embryoplastic period of tooth development. In order to obtain a satisfactory explanation of all the follicular cysts we must assume that they are true cystomas, true neoplasms, resulting from the growth of a matrix destined to form hollow spaces and that this matrix is particularly and especially stimulated to growth when there has been some displacement of the embryonal teeth ; further, that a follicular cyst may develop from the follicle of a developing tooth, or from the germs of the enamel organ, but in all these cases it is principally either remnants of or tissue derived from the enamel organ or pulp that is concerned,

because it is hardly possible to account for the epithelial cells lining the cyst in any other way than as derived from the enamel organ, which is an epithelial structure. It has been thought that from the condition of the denture structure proper found in these cysts some conclusion could be reached as to the time when the cyst began growing.

Thus Koenig says that a cyst beginning to grow during the embryoplastic period of the development of the tooth follicle, only small hard plates would be found in the cyst wall, while in cystoma beginning at a later period more or less completely developed teeth would be discovered. While this is true in so far as the presence of rudimentary enamel plates would undoubtedly indicate that the cyst commenced early in the history of the tooth follicle, I cannot understand that more or less normal teeth must indicate a late origin for the cystoma, because I can see no reason why the growth of the cyst should necessarily prevent the germs destined to form the tooth from becoming mature tissue. The clinical history of the cystoma first described indicates that the cyst began to grow at a very early period of the development of permanent molar teeth, at least before the period of crown and root formation, and yet the cyst contains two fully developed though malformed molars.

In the multilocular or proliferating variety of dentigerous cysts a new and important element is introduced, namely, proliferation giving the tumour the power of unlimited extension. These tumours differ in no way from the proliferating cystomas of the ovary or the breast, and the specimens described are pregnant examples of this variety of dentigerous cysts. Magitot thinks that the formation of the new cysts is due to bulging at certain points, the neck of which becomes narrow and finally by contraction and constriction of this isthmus the bulging part becomes separated from the main cyst and thus a new cyst is formed, or two or more follicles may simultaneously become the seats of cysts. Falkson calls this variety, *cystoma proliferum folliculare*: in the case described by him the tumour exhibited many cysts with an intervening alveolar tissue; the alveoli were lined with a single layer of epithelial cells and the interior of the alveoli was filled with a delicate tissue composed of cells with long processes forming an intra-alveolar net work; from this he concluded that his cyst, which

reached the size of a child's head, was derived from a supernumerary or misplaced enamel organ or its matrix to which the alveolar contents as well as lining wall would correspond. This is an apparently isolated case, the matrix remaining latent long before it underwent pathological development. Besides this adenomateous proliferation of the epithelium of enamel pulp, giving rise to multilocular cystomas, Orth states that Bruns has observed this epithelium giving rise to carcinoma; the development of such carcinomas would be analogous to the growth of branchial carcinomas in connection with branchial cysts. The multilocular, proliferating maxillary cysts are much less frequent than the simple follicular variety.

To recapitulate: There may develop in the jaws periosteal or teeth cysts connected with the fangs of diseased teeth. They are caused by inflammatory changes in the periosteum around the root or by the development and softening of fibromas; the fangs of the tooth, which is normally situated in the jaw, project into the cavity of the cyst.

These may also develop in the maxilla cystomas, simple and proliferating, from a matrix connected with the tooth follicle or enamel organ, their connection with the tooth becoming evident from the structure of the wall as well as from the fact that they usually contain either rudimentary or fully developed, though malformed, teeth.

PATHOLOGICAL ANATOMY.

The contents of the dentigerous cyst may be simply clear and thin, or a more albuminous viscid fluid containing cholesterol crystals and of various shades of colour, owing to admixture with blood; in the contents may or may not be found epithelial cells derived from the lining of the cyst. In case infection with pus microbes takes place the contents become purulent and large masses, loosened from the cyst wall in consequence of the inflammation, will then float in the pus.

The wall proper of these cysts is usually composed of firm connective tissue, with but few vessels, upon the inner aspect of which is situated a single layer of epithelial cells which, though originally cylindrical, may on account of the constant intra-cystic pressure present considerable variation as to shape and size. In certain cases the vessels in the cyst wall have been so numerous and so large as to give rise to pulsation synchronous with the rapid pulse.

Calcification of the wall may also take place. In some part

of the wall will usually be found rudimentary or more or less developed teeth, most frequently simply the crown is found ; it is usual for the fang of such a tooth, if it have one, to be imbedded in the tissue of the wall, while the crown projects into the cavity of the cyst. Usually the crown points in the direction of the alveolar margin of the affected jaw, but the tooth may have been inverted. Occasionally the tooth or rudiments thereof may be found loose in the fluid. In the case first described two quite fully developed but malformed molars were found projecting into one large cyst ; here it may be assumed that the two independent cysts became one from the disappearance by pressure of the intervening wall ; the fact that two teeth were found involved shows that a displacement of two enamel organs may take place just as well as of one ; the second case also illustrates the displacement of two organs.

SYMPTOMS AND DIAGNOSIS OF DENTIGEROUS CYSTS.

The symptoms of a follicular cyst are in the main local and consist of a very gradual expansion of a jawbone at some point, with a corresponding disfigurement of feature. The growth is slow and painless ; the absence of pain is characteristic of dentigerous cysts, although in one or two instances of cyst in the lower jaw there was much pain, and this was thought to be due to direct pressure upon the inferior dental nerve after its bony canal had been completely absorbed. While the growth is intra-osseous and hidden in the jaw, fluctuation cannot be obtained, but as the bone gradually becomes thinner and thinner from the pressure, atrophy on account of the growing cyst, the bony walls soon yield to pressure and fluctuation is produced, the yielding wall returning to its normal shape with a peculiar and characteristic kind of crackling, called onomatopoeitically *craquement* or parchment crackling. The skin usually remains movable over the tumour while the mucous membrane becomes tense and congested. A very valuable hint to correct diagnosis is the absence from the proper place in the alveolar border of some tooth or teeth which should have appeared and have not been removed. The presence, or the known past presence of every tooth does not necessarily demonstrate that a cyst in a jaw is not follicular, because cysts have developed from supernumerary and temporary teeth and from supernumerary enamel organs.

Follicular cystomas appear most frequently at, or soon after the time for the eruption of the successional tooth upon the

impaction of which the growth of the cyst seems most frequently to depend, but instances are not wanting of cysts developing later ; thus Jourdain mentions a case occurring in the upper jaw of a man sixty years old. Salter states that the upper incisors are more frequently involved than any other teeth, the cyst thus formed often dilating into the maxillary sinus and giving rise to symptoms that often lead to mistakes in diagnosis, the cyst being taken for abscess and other diseases of the antrum. Exploratory puncture of the cyst will demonstrate the presence of a usually clear fluid containing cholestearin crystals and sometimes epithelial cells ; there will be pus, of course, in case infection has taken place.

The differential diagnosis between the simple and the proliferating follicular cyst cannot be made definitely without incision into and direct inspection of the interior of the tumour. In conclusion it may be stated that the gradual and painless enlargement of a maxilla at any time, but more particularly during the period of second dentition, often connected with the unaccountable absence of some permanent tooth, should always suggest and usually means a follicular cyst. This probable diagnosis will receive further confirmation when fluctuation and parchment crackling demonstrate fluid contents and the gradual atrophy of the bone ; and exploratory incision, which can be made the first step in the operative treatment, will render the diagnosis between follicular cystoma and other cystic tumours positive one way or the other, and if the tumour be follicular, the incision will also show to which variety it belongs.

In the history of the treatment of dentigerous cysts are found innumerable mistakes in diagnosis by some very illustrious surgeons, owing to which unnecessarily severe procedures, such as resection of the affected maxilla, were resorted to for the cure of simple follicular cystoma. Syme, Lisfranc, Gensoul, Legouest, Maisonneuve and others all excised one-half of the inferior maxilla under the mistaken diagnosis of osteo-sarcoma, while the real condition was a typical, simple, follicular cyst. Marchand reported a case in which a dentigerous cyst of the interior was mistaken for a sarcoma of the superior maxilla and resection of the maxilla was performed. He advises that in order to escape such an error, which may seem almost unavoidable, the antrum should be explored with a trocar in order to detect, if possible, the tooth. Incision into the antrum would be more certain and consequently more satisfactory.

TREATMENT.

The treatment of the simple variety is obviously plain and efficacious, namely, to incise the cyst as early and as thoroughly as possible, remove the impacted rudimentary or fully grown tooth, scrape away the epithelial lining and pack the cavity with suitable material. In some instances it may become necessary to remove part of the jaw and of the cyst wall, in order to gain access to the cavity. Many surgeons advise that such operations be done, as frequently as possible, from within the mouth. While surgeons have erred in making too aggressive operations in case of simple dentigerous cyst, error has also been committed in treating proliferating cystomas ineffectively, subjecting the patient to many operations, each with its risk, where the correct one would be enough. Thus Mr. Syme narrates a case of such a tumour in the lower jaw, in a woman, on whom he operated three times by incision into the cyst, each time with only temporary benefit. Five years after the first operation he was obliged to remove one-half of the mandible. It is plain that when such proliferating cystomas have reached a considerable size it will be impossible to incise all the small cysts, some of them microscopic, any one of which, if left unopened, would go on proliferating. Koenig consequently advises exsection in all cases of proliferating cystomas of any size. As already indicated, the surgeon should regard the incision into a supposed simple cyst as exploratory, because a differential diagnosis between a simple and a proliferating cyst, particularly in the early period of growth, cannot be made without direct inspection; and the surgeon should also prepare the patient and be himself prepared, for the more severe operation in case the growth should be a multilocular one. In fact, it would seem to be a good plan, as suggested by McLane Tiffany, in all cases of operation upon tumours of the maxillæ, to incise the tumour first, in order to be absolutely certain that mistake in diagnosis may not result in an unnecessarily severe and disfiguring operation.

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DENTAL DOTS.

By D. V. BEACOCK, L.D.S., Brockville, Ont.

WHEN a man makes a Quack of himself, he could not by words more plainly explain the fact that he is not qualified to command a first-class patronage. If he was, he would certainly prefer it, but knowing his inability, his only hope is to get up an extensive practice among the ignorant, poor and penurious

In cavities that are very shallow, the pulp not being exposed, but very nearly so, it might be dangerous to drill for retention of filling or otherwise shape the cavity, a sticky oxyphosphate placed in the bottom of the cavity, and a pellet of gold placed thereon and pressed into place, may be used successfully, the rest of the filling can then be built out, condensed and finished.

Antipyrine in solution applied to the cavity after extracting a tooth, is good to arrest the hæmorrhage, and much more pleasant than perchloride of iron. I sometimes use chloroform in the same way, which answers a double purpose.

Bristles, such as can be had at the shoemaker's, are very useful for cleaning hypodermic needles, better than wire in many instances, as they do not corrode.

Other things being equal, a dentist ought to improve as he grows older, within certain limits ; but some can learn more in one year than another would in a whole lifetime. But all can improve themselves in this age of reading and progress.

Iodoform oil is made by shaking amorphous iodoform into ten parts of oil of lavender. Very pleasant and useful.

Much of the unsatisfactory worker of copper amalgam arises from ignorance in not knowing how to work it properly. The material should not be heated and thrown into a cold mortar and instantly chilled, but kept warm while being vigorously rubbed and worked with a pestle in a good-sized mortar. Small sized glass and porcelain ones are utterly useless for preparing copper amalgam with any satisfaction.

No dentist is worthy of reputable patronage who is not master of his profession, a gentleman in his manners, cleanly about his office, free from demoralizing habits, honest in his dealings with his patrons, and of good moral character ; while he may more reasonably expect to be more and more successful

the more nearly he meets the requirements of modern, refined and intellectual society.

Save up all your old waste bits of lead and other soft metal. Melt into a round or square block by pouring into a collar-box or other similar mould. Very useful for striking up gold caps, etc.

The dentist or surgeon who communicates a disease, syphilis perchance, to his patients, by the use of an impure instrument, has a burden of sin upon him greater than which there are but few. Besides, exquisite cleanliness and absolute freedom from germs, constitute half the battle in many operations in dentistry as well as in surgery. (Miller.)

Buy a sheet of carbon paper at any stationer's store, and cut it up into strips three or three and a half inches long by three-quarters wide ; this makes just as good articulating paper as any you can buy at the dental depots, and not one-twentieth the cost. There is a red kind which I use, and find very useful in certain cases. In fitting teeth and crowns, this carbon paper is almost indispensable for getting nice adjustment.

To clean wax get any old tin or skillet, put all your waste bits of wax, cards from artificial teeth into it, put a couple of inches of water in to keep the wax from burning, boil till all the wax is melted, then pour a pint of hot or boiling water into a washbowl or other suitable vessel, empty the contents of the skillet into this and let it stand till next morning. All the sediment will have gone to the bottom. Scrape this off, and should the wax not be clean enough, repeat the same process, only this time add a teaspoonful of sulphuric acid to the melted wax before pouring ; this will make the wax clean and yellow, as when first made by the bees. It will not do to pour it into cold or even warm water, it must be either hot or boiling. If the above directions are carefully followed, there is no wax so dirty but what may be made just as good as ever. Wax can be toughened by adding either resin, Burgundy pitch, or, what is better, Venice turpentine.

Dominion Dental Journal.

THE RESTORATION OF BROKEN INCISORS.

Among children and youths it not infrequently occurs that from falls or other accidents one or more of the incisors are broken off to a greater or less degree. In such cases the problem of effecting a suitable restoration to usefulness and sightliness is calculated to tax the resources of the most skilful dentist.

When, however, about half of a crown is absent and the pulp involved to a degree incompatible with its preservation, it has seemed to me desirable to retain the crown stump rather than to amputate it and place a porcelain crown on the root. My own method of procedure is as follows: We will suppose the superior centrals to have been broken and the right central selected as a model for the description, which will equally apply to the other central or to any incisor under like circumstances.

Free access to the pulp-chamber is gained by cutting an oval-shaped opening. After thorough treatment and the subsequent filling of apical part of the canal, a countersink or recess is cut in the end of the crown, preferably with an engine pin-centred fissure bur, followed by a wheel-bur cutting also on its end to form the rearward slot of the recess. A piece of thick gold or platinum plate is drilled, cut, and then fitted in the recess. A suitable post is then inserted through the plate, to which it is secured by wax, removed, and soldered. The end of the post is then cut off flush with the plate, and the piece replaced on the crown leaving the plate projecting from the recess. A short, thin cross-pin matching-shade plate tooth is selected, ground to fit the smoothed natural crown end, and then backed with thin platinum, which is shaped and conformed to the lingual face of the crown. With the plate-punch and a small fissure-bur a slot is cut in the extension of the backing to allow the plate to project through it, replaced in the crown, secured with hard wax melted over it with a hot burnisher, removed, invested, and soldered so that the gold flows over the backing and its extension. This is then secured in the root and to the crown with cement, a thin film of which almost invisibly joins the porcelain tip to the crown and makes an impervious joining of the backing extension to the lingual face of the crown. The recessed plate and backing extension prevents any turn

ing of the structure, while the post secures it against displacement under the strains of incisive use.

Much of the preliminary work may be done from an accurate impression taken after the ends of the crown have been ground smooth and true, but the fitting, assembling, and soldering of the pieces should be done while the patient is present in order to insure the nicety of adaptation on which the permanent success of the operation will depend.

A somewhat extended and very satisfactory experience in this class of restoration affords a reasonable expectation that the method will also prove acceptable and useful to the profession.—DR. E. AMEND, *Cosmos*.

ÆTIOLOGY OF CANCER.

Schuchardt, reviewing Hauser's monograph on *Cylinder-celled Carcinoma of the Stomach, &c.*, considers the various theories which have been adduced.

He agrees with Hauser in setting aside the infection theory and the hypothesis of a still undiscovered cancer bacillus. In all "infective tumours" produced by micro-organisms, and all other new tissue formations brought about by parasites, we have to do merely with a growth of the local tissue, and the metastases of such infective tumours are never found proceeding from a growth of cells which have escaped from the primary mass. On the contrary, the metastatic formations arise solely by the action of escaped micro-organisms upon the tissue in which they come to rest, just as in the case of the primary mass. The successful transferrings of carcinoma from one animal to another (Hanau) are to be regarded merely as transplantations with further growth of the transplanted tissue, and show nothing more than that the cancerous epithelial cells may, under favourable circumstances, continue to grow after transplantation to another organism. Of a true communication in the sense of the infectious theory, it were only possible to speak when by inoculation of a micro-organism, or the implantation of a living tissue containing it, the tissue of the new host were themselves incited to cancerous growth.

Cohnheim's inclusion theory considered by Hauser now as untenable has for Schuchardt this recommendation, in the first place, that it was the first truly universal theory of tumour formation, although it consists neither with the irritation theory nor with Thiersch's hypothesis of a disturbance of the histogenetic balance between the epithelial and connective tissues—namely, by senile alteration on the part of the connective tissues with persistent formative activity on the part of the epithelium. Cancer is, however, by no means a disease peculiar to old age—developing, as a matter of fact, most frequently in the 10 years between 40 and 50. Such a disturbance of balance, if it be present, must alter the whole surface of contact (be present, this is all along the line), and can at best only serve as a predisposing cause to favour the development of a cancerous tumour. The local causes it has long been customary to find in chronic inflammatory process which sometimes precede cancer for years, and then suddenly or gradually develop into it.

For Schuchardt, however important these things may be as conditioning causes, it is not to be forgotten (1) that they are only demonstrable as such in relation to certain well recognized and defined types of the carcinomata; (2) that by far the greater part of the carcinomata, and especially most of those occurring in the stomach and intestine, arise without precedent chronic irritation. Most internal cancers come like a thief in the night, without warning.

The irritation theory, then, is not one of universal applicability; but even in the cases where chronic inflammatory processes have been in existence, the chronic irritation can only be regarded as a local predisposition to cancer formation. The actual cause, the unknown x (Volkmann), which must accompany the typical epithelial proliferation is not brought one step nearer to our knowledge by the irritation theory.—*Centrallblatt. f. Chir.*, 1891, No. 38.)

FISSURE DRILL.—I have a suggestion to make in regard to the ordinary fissure drill. When it is worn considerably, if you will grind off the end diagonally, on an oil stone, as you see here represented, little spurs will stand up along the edge of the ground surface at a very sharp acute angle. For entering a fissure or extending it by drawing the rotating end back and forth over the edge of enamel it will be found very effective. It has been very satisfactory to me, and it is very easily sharpened.—Dr. CASE, *Ill. So.*—*Ohio Journal*.

Reports of Societies.

STUDENTS' SOCIETY, NATIONAL DENTAL HOSPITAL.

The last ordinary meeting of this Society was held on Friday, October 9th, at 8 o'clock.

R. DENISON PEDLEY, Esq., President, in the chair.

The minutes of the previous meeting were read by the Secretary, and confirmed.

Messrs. Simms and Shefford were nominated for election at the next meeting.

CASUAL COMMUNICATIONS.

Mr. SPOKES showed by means of a lantern slide, a case of fistulous opening on the cheek, caused by a lower molar root. The patient was advised by as many as three men to have the stump removed, but owing to their advice not being followed out, the above mischief resulted. The root has now been removed and the case going on well.

Mr. HUMBY mentioned a similar case: At the same time he asked Mr. Pedley's opinion as to the use of Hydrag. Perch. both on a living and a devitalized pulp? In responding to which Mr. Pedley replied at some length referring principally to an article of his on the subject which appeared in the August number of the Journal of the British Dental Association.

The PRESIDENT showed a second lower molar and wisdom, the former having a cavity in its distal root. The case was one of more than ordinary interest. The cavity was not the result of decay, nor was it due to pressure of the wisdom tooth. It had all the appearance of an eaten out cavity, such as one often sees in temporary teeth. The President said that probably a foreign body, such as a small fish bone, had been pushed down between the gum and the tooth, and the irritation set up had resulted in absorption of tooth substance, thus exposing the nerve and causing the patient unbearable pain.

Messrs. HUMBY and CLARKE mentioned similar cases.

Mr. READ spoke of a case of three implanted teeth, one of which, a first molar, had given rise to antral mischief, it was

loose though very firmly socketed, and on removal was found to be slightly absorbed at apex of roots.

Mr. REGINALD BASCOMBE was then called upon by the President to read a paper from Mr. Thos. Gaddes, entitled, "Some Observations on the Physiology and Seat of Pain."

Mr. SPOKES, rising to comment on the Paper, remarked that Mr. Gaddes evidently had not expected any sort of discussion, but he was of opinion that it should not be altogether passed over without remark. He felt that any comment or criticism which he might offer would be of a friendly description, more especially considering the relation borne by the author to the College and Students' Society; he, however, would like to point out and explain in as few words as possible that there were functions generally ascribed to nerve centres, other than a purely reflex one: among these were "Conduction of Stimuli," "Transference of Stimuli," and some others. So that:—

1. A possible explanation of the instance mentioned in the paper where in hip disease a pain was felt in the knee, might be given by the supposition that the stimulus from the former situation on reaching the spinal cord is "transferred" to a nerve fibre passing up from the knee.

2. Again a stimulus from a wisdom tooth on reaching the nerve centre may be sufficiently strong to be transferred by "radiation into a neighbouring centre which receives normally the impressions from a neighbouring tooth.

- 3 With regard to the peculiar sensations after amputation, one can suppose that as the divided central nerve ends are subjected to pressure, during granulation and contraction of the wound, a stimulus is conveyed to the centre, and according to the normal law by which sensation is referred to the periphery of the nerve, the centre will translate the message as if it were still received from the toes. Another explanation of the phenomena may be given by the presence of the very fine filaments of the *nervi nervorum*.

There being no more remarks, the meeting was adjourned, after a vote of thanks had been accorded to Dr. Gaddes for his very interesting Paper, proposed by Mr. Humby, and seconded by Mr. Clarke.

The next meeting will be held on Friday, November 6th, when a paper will be read by Mr. Rushton.

MANCHESTER ODONTOLOGICAL SOCIETY.

THE opening meeting of the above named Society, took place on Tuesday, October 6th, at the Grand Hotel, Manchester. Mr. I. Renshaw, President, occupied the chair, and there was a large attendance of members.

It was announced that Mr. G. R. Skipp had resigned his seat on the Council, and the vacancy thus created had been filled by the council appointing Mr. W. Dyke, in accordance with law 13.

NEW MEMBERS.

Mr. David Headridge, L.D.S. Eng., 279, Oxford Street, Manchester & Mr. W. R. Birkett, L.D.S. Eng., 5, Museum Street, Warrington, were proposed for membership.

CASUAL COMMUNICATIONS.

Mr. Collett showed left upper first bicuspid, having at the apex of its root, a large absorption cavity, occasioned by the second bicuspid which was placed immediately underneath it.

Mr. Renshaw showed a model of an upper jaw with an exceedingly contracted and distorted arch.

PRESENTATION TO DR. PARSONS SHAW.

The President, in rising to make the presentation, said : Gentlemen, I rise to perform a very pleasing duty, and that is, to present to our old and esteemed friend, Dr. Parsons Shaw, an Illuminated Address on Vellum on the occasion of his leaving our shores to take up his residence in his native land. I know that Dr. Shaw would not care to listen to any effusive words of flattery from me, but I will say that we all esteem Dr. Shaw and we are sorry to lose his genial presence from amongst us (hear, hear). It was due to Dr. Shaw that the Odontological Society of Manchester was formed (Applause). He has always been very energetic, whenever its interests have been in question, and I am sure, that when he gets to his native home, he will often think of this child of his, and wonder how it is growing. We shall always be pleased to hear from Dr. Shaw. We know he will take an interest in our proceedings, and we shall be pleased to send him all the transactions of the society, so that his heart may be gladdened by what he sees in them (Applause).

Mr. RENSHAW then handed the address to Dr. Shaw, and in doing so said :—"This address is not only expressive of

our feelings towards you, but it is a very beautiful one also. I trust you will look on it with feelings of pleasure ; that it will bring to your remembrance old faces and old friendships, memories that will never fade so long as your memory shall last (Applause.)

MANCHESTER ODONTOLOGICAL SOCIETY.

To PARSONS SHAW, Esq., D.D.S., Oxford Road, Manchester.

DEAR SIR,—We the undersigned Members of the Manchester Odontological Society, cannot but regard your retirement from the active pursuit of your professional duties, and from the membership of our Society, in consequence of your removal to your native land, as a fitting occasion on which to convey to you some expression of the high esteem in which you are held amongst us, both with regard to your personal character and the honourable position you have attained as a member of our profession.

You will ever be remembered, especially in this district, as the Founder of the Manchester Odontological Society ; as President and subsequently one of its Vice-Presidents and then as Honorary Treasurer ; you have contributed to a very large extent to its success.

During the many years you have practised as a dentist in our midst, you have earned for yourself an honourable reputation, and the esteem of a wide circle of friends.

We beg of you to accept this address with our united and earnest hope that you may long be spared to enjoy the leisure you have so well and ably earned.

Signed on behalf of the Society,—

ISAAC RENSHAW, *President.*

PETER HEADRIDGE, } *Vice Presidents.*
W. DOUGAN, }

HENRY PLANCK, *Treasurer.*

W. BROUGHTON. GEO. HOLT, } *Members of the*
W. DYKES, T. MURPHY, } *Council.*
W. HEADRIDGE, WM. SIMMS, }

G. G. CAMPION,

EDWARD P. COLLETT, G. O. WHITTAKER, *Hon. Secs.*

G. W. SMITH, } *Ex-Presidents.*
LEOPOLD DRESHFELD, }
HENRY CAMPION, }

Mr. H. CAMPION said : I have just been asked to say a few words in support of the speech which you have just heard from our worthy President. It has come upon me somewhat unawares, but I feel I should be depriving myself of a little pleasure if I did not make a few remarks with regard to the loss which we are about to meet with in the departure of our old friend from amongst us. We have heard that Dr. Shaw is about to leave us, and I hope it will be for his good, and therefore, it is a matter of congratulation. But as regards ourselves, I fear we can scarcely take such a favourable view of the case, particularly when we take into consideration the time at which we are losing him. I look back to my early connection with Manchester, and one of the first professional acquaintances which I made, was that of Dr. Shaw, and I am happy to say it has continued to the present time. And going back to that early date enables me to draw a little comparison between the state of our profession at that time, and the condition in which it is when Dr. Shaw leaves us. I can also say with pleasure that we owe a great deal to him. He has taken an active and efficient part in placing the profession in Manchester in the position it now holds, and which every one will recognise as being so very different from what it was 35 years ago. It is an unfortunate time for us to be losing him, as I think his advice would be of value to us. We are looking forward to our having in the course of time, and I hope not a long time, a new Dental Hospital in Manchester, and I think that Dr. Shaw's advice as to the design of the building, &c. would have been of great service to us. But under the circumstances we must forget all our own personal wishes and hope that his present move will promote his own personal happiness. All we can do is to hope that he will be spared for many years to enjoy health and happiness. I have great pleasure in supporting the remarks of our President (Applause).

DR. SHAW, who was received with prolonged applause and who was sensibly touched by the warmth of his reception, said : Mr. President and Gentlemen, I think I may safely say that if I had come here to-night for the purpose of advocating anything in the interests of our profession ; if I had come for the purpose of combatting anything that I thought was wrong or not for its interest, I should have had no hesitation in knowing what to say or how to say it. But I am now in such a position of embarrassment as is utterly impossible for me to

describe. I can stand pretty well what my enemies say about me, and I can maintain my self-respect, but when my friends begin to praise me, I really don't know what to do. I surrender at discretion. I suppose you are saying :—"You stupid man, why don't you say, I thank you." Well, I say, "I thank you." What is that? How far do those words convey the feelings you have excited by presenting me with this address. It is impossible for me to describe those feelings, but I leave you to imagine what they are. You have referred to the formation of this Society, and when I look around me and see its position, and see the number of members present, and when I understand the position that the Society has assumed, it is to me a matter of great pride and satisfaction. As you have said, I shall never forget the "baby" I have nursed into existence. I have one thing more to say about it, and that is this, I know that oftentimes I have appeared in this Society to be arbitrary and dictatorial (No, no), I have never been so except at times when I felt as though someone must take the lead. I have always had a clear idea of what this Society was formed for, and what uses it was likely to perform. I may have been mistaken, perhaps I was in many instances, but I had a clear idea, and that idea I did my best to carry out. I leave it to the future to determine whether I was right or wrong. But you may depend upon it that I have never done anything in this Society, unless it was for the interest of the society or for the profession. If I have at any time appeared to be dictatorial, or even dogmatic, it has not been from any desire to exercise that spirit, but simply that I might carry out those views, which I believe to be for the benefit of this society. I have now retired, definitely retired, from the practice of dentistry, and in all probability when I get settled down in my new home, unless someone drops into my house and reads this address, it may be that they will never know that I knew anything about dentistry. But depend upon it that on every occasion I shall display my interest in the profession and do everything I can to promote its interest. If I have had a success beyond my abilities as a dentist, it has been more owing to circumstances than to any particular ability of my own. It has been a source of satisfaction, of gratitude, and of pride to me that I have been so blessed. I am going to leave you. I am going back amongst my friends, in fact, I have been amongst them since I saw you last. I need not tell you that it will be very natural for them to ask

themselves the question—if, indeed, they have not asked each other already—"How has he conducted himself since he has been gone?" It will be 35 years in May since I left America and came to England to practise dentistry. Many of my friends there will be anxious to know what sort of position I have assumed here; this address will tell them. I don't know what more I can say, except to thank you, Mr. President, and every gentleman who has signed this address, and every member of this Society for the cordial manner in which you have received me to-night, and the kindly interest you have displayed towards me. I am certain that on whatever I have done you put the best possible construction (Loud Applause).

The President then delivered his address. (See page 961.)

Dental News.

NATIONAL DENTAL HOSPITAL AND COLLEGE.—The Annual Dinner of the Staff and Past and Present Students and Distribution of Prizes will take place at the Holborn Restaurant, on Friday, November 20th, at 7 o'clock. John Langton, Esq., F.R.C.S. in the chair. Tickets to be obtained from the Secretary at the Hospital.

At the October Sitzings of the Board of Dental Examiners, the following candidates having passed the necessary Examinations, were admitted Licentiates in Dental Surgery ;—

Abraham Berlyn, Birmingham.

Charles E. Bromley, London.

Percival Leigh, Leeds.

Franklyn C. Lewis, Folkestone.

Joseph C. Preston, London.

Philip B. Reading, Sydney, N.S.W.

Joseph Royston, Douglas, Isle of Man.

VACANCIES.

The Dental Hospital of London, Leicester Square.—The posts of Dental Surgeon and Assistant Dental Surgeon are vacant. Applications to be made to the Secretary. 3332

Liverpool Dental Hospital.—The post of House Surgeon is vacant. Applications to be made to the Dean.

British Journal of Dental Science.

No. 572. LONDON, NOV. 16, 1891. VOL. XXXIV.

SOME EXPERIMENTS ON THE PROPERTIES OF AMALGAMS.*

By AMOS KIRBY, L.D.S.

We are all familiar with the fact that several metals are soluble in mercury, and that when mixed in proper proportions, the resulting compounds are not without value to us in some branches of our art. They are said not to enter into chemical combination, the action which takes place during amalgamation is possibly more like that of crystallization, the mercury taking a similar part to that of the water of crystallization in crystals of salts.

The history of dental amalgams need not detain us ; they were probably not used at an early date, but were much discussed in the early dental periodical literature, and before that in the pages of the *Pharmaceutical Journal*, where a formula was published by the late Mr. Arnold Rogers in February, 1850. The compound there described consisted in preparing separate amalgams of pure gold and pure silver, which were mixed together immediately before being used. In my own hands this substance proved too soft for general use, although where it was not exposed to wear it might have a preservative value.

The perusal of this formula led me on one occasion to try an amalgam made with fillings cut from a gold coin. The result was not altogether unsuccessful, as the stopping remained in evidence for a great number of years, indeed, considerably too much so, for the preservation was accompanied by the discolouration of the two central teeth in which it was inserted, an effect which was doubtless due to the presence of the usual alloy of copper contained in the coin.

*A Lecture delivered at the National Dental Hospital.

We are no doubt all acquainted with the formulæ published in the early edition of *Tomes' Dental Surgery*, some of which may be employed with great advantage; and the pages of the same work contain an account of experiments made to ascertain how far amalgam stoppings, as then used, adapted themselves to the walls of a cavity.

That amalgams were not altogether reliable substances for the formation of stoppings was evidently recognised at an early period, although there were accidental advantages in the way in which they were used, that tended to produce better results than some of the later methods. The prevalent use of Cadmium as an ingredient had, on account of its solubility, an injurious effect on their reputation. In spite of their defects certain good qualities, (added perhaps to the fact that we do not always act up to our convictions,) prevented their entire abandonment and led to enquiries about the causes of their failure. Up to that time nothing definite was known; it was asserted on one hand that they contracted very considerably, and on the other that they expanded so much, as frequently to cause the splitting asunder of a strong walled tooth. To clear up the matter with scientific accuracy, experiments were inaugurated by Mr. Charles *Tomes*, who proceeded by the way of taking the specific gravity of masses of recently mixed amalgam and repeating the process as the piece became finally hardened.

Of course, no more accurate or perfect method could be devised, as it indicated the minutest changes of bulk, and Mr. *Tomes'* numerous experiments involving the greatest care in manipulation and calculation are of the highest interest and importance. Following the suggestions given by these experiments, I endeavoured myself to ascertain the changes in bulk of various amalgams which came under my notice in a similar way, but in addition to my balance not being so delicate as might be desired, I found the trouble of getting rid of adherent air, and of making the necessary calculations, and allowances for temperature was so great when it had to be repeated a considerable number of times, that I began to consider if some other plan could not be used. One of my first experiments consisted in introducing amalgam paste into a bit of glass tube, open at both its ends, one of which was held against the finger whilst the substance was packed into it; this method indicated a decided tendency to contraction in some of the stoppings in general use, as the mass could be easily shaken

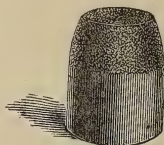
out soon after the stopping had become hard. A piece of glass tube was next closed at one end, so as to represent a rather deep tooth cavity of moderate size, a large one being rejected as introducing possible sources of error. This was filled with amalgam formed from precipitated silver which was smoothed off level with the orifice of the tube, in the hope that a magnifying glass would show if any expansion or contraction took place. It was examined in a few hours, and the projection found to be so great that no glass was required to show it, the surface was then ground off level with the glass and it was laid by until the following morning, when expansion had again taken place, apparently to as great an extent as before; after another grinding some further expansion was noticeable, but to a much smaller extent.

Although the expansion was so great it did not cause the splitting of the tube, which although it was not very thick, seemed to have controlled the direction in which it took place, and produced what appeared to be a flowing from the orifice; some tubes of the same metal which were afterwards made, split in two, in the course of a few days and others after a longer time.

In my own hands silver amalgams whether prepared with filed or with precipitated metal, never failed to expand in a remarkable degree in whatever way they were tested. Some specific gravity tests which have been made by another hand, however, appear to point to considerable contraction. But the method which was used, contained sources of error sufficient to account for the discrepancy. The amalgams for these tests contained as little mercury as could be used to form a paste; this allowed a certain amount of air to be enclosed in the mass. These enclosed particles of air would be slowly dissolved or driven out and set free in the long time during which the tubes were allowed to remain in water; the result being an apparent diminution in the bulk of the amalgam, whereas the real diminution was due to the liberation of the air which was contained in its substance and in the tube surrounding it.

As the evidences of expansion were so unmistakable in the tubes of silver amalgam, other metals or alloys of metal in different proportions were placed in similar tubes, in the hope that they would act in a similar way, but none of them altered in bulk sufficiently for the change to be seen, even with the help of a magnifying glass. When they were

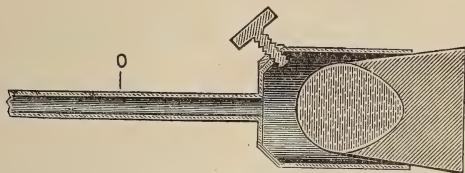
first placed in the tubes they appeared to be well in contact with the glass which presented an almost mirror-like appearance, but after they had been hardened for some time, their upper parts became slightly dull. After some days they were put into liquid dye which was contained in a small cup that screwed into the lower end of a syringe, the piston of this was then drawn up and in that position held up for a short time, which of course had the effect of removing a considerable portion of any air that might have found its way into spaces left by the shrinkage of the material away from the glass. When air was re-admitted the colour was generally found to have been forced in between the stopping and the glass, to about half the length of the tubes, as well as into some of the capillary tubes, existing in the glass; this shewed how severe the test had been, and proved pretty positively that the lower part of the filling was still in good contact with the glass, however much the upper part had shrunk away from it. After a further time the shrinkage in the upper portions of the amalgams increased, until with some of them the mass took a shape similar to that shewn on the diagram. It will be observed



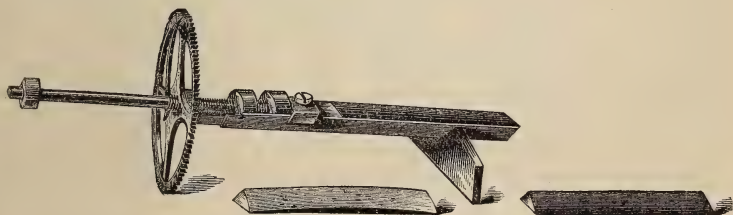
that the shrinkage is greater at the upper part and becomes less lower down, an action which may be better explained later on, when the subject of preventing it is under consideration. The diagram suggests and indeed represents the spheroidal form sometimes seen in stoppings, but which only exists in their upper part.

It will have been noticed that these experiments only tended to show whether amalgam stopping when used in the ordinary way, fitted so well to the walls of a cavity, as to give reasonable hope that they might prolong the life of a tooth to a satisfactory extent. But another set of experiments was going on at the same time which were intended to prove whether amalgams generally expanded or whether they contracted, and also whether these changes if they took place, were greater or less in one substance than in

another. The first apparatus used for this purpose bore some resemblance to a thermometer, and consisted of a fine tube attached to one end of a chamber which had an opening that could be closed by a stopper, it was provided with a screw passing through a water tight packing. Whilst in use it was kept



in water and maintained at a temperature of as nearly 98° as possible. The mass of metal to be measured was introduced under water, the warmth of which assisted in dispensing any particles of air that might be adherent. The tube, which was allowed to stand out of the water, was then dried, and by a little turn of the screw the level of the water was brought to its middle. When thus arranged the water would rise if any expansion took place, or fall in case of contraction, and by introducing pieces of a given weight or a given bulk, the relative changes in size could be ascertained with some accuracy. By this means evidence was obtained of considerable changes in bulk in different materials, but as with the specific gravity test, the process was a slow one, especially if it was desired to extend an observation over several days, as is almost always necessary. Another method was therefore devised, the apparatus for which consists of a small V-shaped trough of platina alloy with the sides at right angles to one another and one of its ends firmly closed. Near to the other end a metal block is adjusted, so that it fits closely to the sides, whilst it slides freely backwards and forwards; beyond the block a fine screw is arranged, provided with a vernier and graduated circle, and forming a micrometer, which although rather rough in finish is really capable of giving measurements of considerably less than one thousandth part of an inch.



The method of using is first to clamp the vernier at a point which is taken as zero, next to push the sliding block up into contact with the end of the screw, then to fill the trough with the amalgam paste which is to be measured, after this to remove the clamp from the index and turn the screw back until it does not touch the block, which still remains in contact with the amalgam. When the amalgam has hardened, the screw is turned gently forward as far as it will go, which will be to a point short of zero if the substance has expanded, or beyond it, if it has contracted.

A mark was put upon each mass or bar whilst it was soft, so that it could be recognized again afterwards, and it was turned out as soon as it had become hard. This arrangement allowed a great number of bars to be in hand at one time, any of which could be put into the trough and measured again as often as desired.

At first everything seemed to be perfectly simple and straightforward; a charge of amalgam was mixed and put into the trough in the usual way of making a stopping, and surplus mercury was removed from the surface, although without any very special care. The bar which was thus formed, was measured with the micrometer and turned out as soon as it had become hard. After a few hours it was put into the trough to be measured again, when it appeared that some expansion had taken place, but no accurate measurement could be taken because the bar had lost its adaptation to the walls of the cavity; the ends having bent slightly in an upward direction, so that there was a vacant space between the upper part and the ends of the trough.

In the course of two or three days the bending had increased very considerably, and the bar finally presented the appearance which is represented in one of those on the woodcut.

As soon as the first bar was hard enough to be turned out of the trough, other batches of amalgam, made from samples of the various fillings in general use, were successively put into it, and as all these without exception, behaved in precisely the same way, it was evident that the property was common to amalgams generally; and nothing has since tended to show that any one of them is exempt from this change when used in the ordinary manner. In the case of single or unalloyed metals such as palladium, some bars showed a tendency to become straight again, after having first assumed the usual degree of curvature, but no similar case occurred

with alloys such as are suitable for dental purposes, and the subject was not followed far in that direction.

On considering what might be the cause of this change of form, which is by itself sufficient to account for the notorious uncertainty of amalgam stoppings, it seemed probable that it might be connected with an unequal distribution of mercury in the parts composing the stoppings; the tendency of their upper portion to become soft from manipulation in packing, being a familiar phenomenon. The mercury not being in chemical combination with the other metals, and some part of it, at least, only acting as a solvent to bind the other and perhaps crystalline parts together—why should it not travel from the parts where it was in excess to those where it was present in less quantity until the whole mass become homogeneous? Such an action would certainly take place if water were the solvent, and if the surplus was not allowed to evaporate, and mercury when alloyed does not evaporate under a high temperature. If this transfer of mercury actually took place, the part at the orifice of the cavity which was softest, and contained most mercury, particularly at its centre, would lose the most during the process, and its centre would assume a cup-like form; the next portion below, would lose and therefore contract less, and in the end the upper part of the mass would take a conical form, which might suggest what has been spoken of as a “tendency to spheroidal.” As the lower part of the mass took mercury from the upper it would increase in size, but its expansion would be restrained in a lateral direction, by the walls of the cavity, and it would, after producing some pressure upon them, force the upper part of the stopping outwards in the direction of the orifice of the chamber, in the manner already described as taking place with the tubes of silver amalgam.

The bending of the bars formed in the micrometer trough, is an action which differs from the above only, in consequence of their shape and of the different conditions under which the action takes place, the lower part being allowed to expand without restraint, as well as the upper to contract.

To find if any transfer of mercury actually took place, amalgam was introduced into a split tube so as to form a long cylinder, the surplus mercury which was squeezed out by the manipulation being allowed to remain at the end where the stopping was packed in. As soon as it was set, the piece was divided in two in the middle and the two ends made to weigh

exactly the same by cutting a bit off from the central portion of one and adding it to the other. The whole of the mercury was then driven off by heat, and the pieces weighed again, when it was found, that one end had contained some grains more mercury than the other.

Another cylinder was then made in exactly the same way, but instead of being cut in two at once, it was allowed to remain undivided for 17 days, to allow time for a possible redistribution of the mercury. The cylinder was then divided and treated in exactly the same way as the other one, the result being that instead of one end losing more mercury than the other, as had then been the case, both lost almost exactly the same amount, thus leaving no doubt that transfer and redistribution had actually taken place.

Although all the experiments which have been described were made with amalgams in a moderately soft condition, others were also made with a much smaller proportion of mercury, but the results with these were most eminently unsatisfactory, the bars constructed from dry mixtures showing a markedly greater tendency to bend than any of the others.

The cause of the failure having been found, the nature of the remedy was at the same time made clear, and of course consisted in the use of a plan which would bring about an equal distribution of mercury through its mass when the stopping was finished. As the excess of mercury at the orifice could not be prevented by using dry amalgam for the whole mass, or removed, if it were used in a softer state, it was evident that it must be got rid of by absorbing it with a quantity of material containing a very small proportion of mercury.

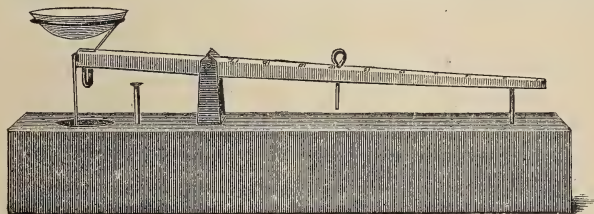
The plan which has recently been called "wafering" was therefore tried, but proved to be quite insufficient; the bars still bent considerably. The method which was finally found to be successful, simply consisted in making the first part of the filing of a decidedly soft amalgam; that is to say, one containing very nearly as much mercury by weight as of filings, and the remainder, (to the extent of at least one-third of the cavity), of a very much dryer compound, or one containing at least twice as much weight of filings as of mercury: the quantity of mercury required for some kinds of filings being rather less than for others, and all newly prepared filings requiring more mercury than those which have been made for a longer time.

The use of a comparatively large proportion of mercury, does not appear to be attended with any disadvantage, provided the amalgam at the orifice is composed of a large quantity of a mixture, containing considerably less mercury than the other part: indeed some of the bars which have kept their shape and colour perfectly well and satisfactorily, are specially marked "soft."

The plan of soaking up the surplus mercury with tin foil was not tried and is objectionable, as introducing an element of uncertainty, for although it would be much better than leaving the mercury unabsorbed; the quantity required to do this perfectly would be so large, that as a result, the upper part of the stopping would be formed of a very soft tin amalgam quite unfitted to bear the wear of mastication.

By following the method described, it was easy to make straight bars which could be measured and stoppings which fitted accurately to the walls of glass tubes and therefore to the cavities of the teeth into which they were inserted, but it was found necessary to exercise considerable care in weighing the mercury, since a quantity which was too small to be noticed by the eye, or to be indicated by a balance which would not turn with a small fraction of a grain, was still large enough to make a considerable difference to the stopping.

The operation of weighing the materials is not very conveniently performed with ordinary scales, which frequently leave something to be desired on the score of accuracy. A balance was therefore constructed which without any complication of parts, is sufficiently delicate, and allows of the ready weighing and turning out of the materials used. As it



Amalgam Balance.

is not possible to get out the very small quantity of mercury necessary to ensure a perfect weighing, with the bottles or holders, in ordinary use, a new form was designed, the orifice of which was partially closed with a regulating pin, and

thus allowed the finest possible stream to be forced out by pressure upon an elastic diaphragm forming its bottom or sides. The materials were at first mixed in a mortar or in an



Mercury Holder.

ordinary mixing tube, but as this occupied too much time, a double mixer was made by fixing two tubes transversely across one end of a handle, this in addition to mixing the two portions at one operation, required but a comparatively small motion of the wrist, to produce violent agitation.



Mixer.

HAVING got rid of the obstacles to taking measurements of bars of amalgam, experiments in this direction were next proceeded with, but they were so numerous that it is not possible to do more than summarize the results. Before this is done, however, it may be as well to state distinctly, that although some expansion occurred with certain substances, it in no case prevented the fatal shrinkage at the edge, which is caused by unequal distribution of mercury, and that although contraction occurred with other specimens, it could in no case be compared in extent with that injurious tendency.

It has been already mentioned that silver amalgams expanded considerably, and it had long been known that they

were good tooth preservers, although too soft to bear mastication. The same remarks apply with equal force to amalgams of palladium, except that they are much harder, both metals also require a large quantity of quicksilver to form a plastic mixture. Palladium, which forms definite crystals with mercury, requires quite four times its weight of that material, unless it has been kept for a long time, and when too old it refuses to unite with mercury at all but is restored by annealing at a very low temperature.

Copper amalgam generally gave indications of contraction, and seemed to alter in length for a good many days, but like all the substances experimented with, it never gave anything like constant results.

Amalgams made from an alloy of silver and tin in atomic proportions, shrank considerably. The addition of more silver lessened this tendency, but not in anything like the proportion to the amount added; when the silver was considerably in excess, the amalgam did not become very hard, although it set rather quickly. Alloys containing rather more silver than tin, with the addition of a good percentage of gold, set well and quickly, and expanded in a marked degree, they also kept their colour when used as stopping, but if too much gold was added, the amalgam was too soft and parted with some of its mercury.

Platina was tried in place of gold, but it can only be added in small quantity, and its effect seems to be much less marked. Zinc was also tried with doubtful benefit.

A source of great trouble and error in the early experiments arose from the fact that filings prepared from newly melted alloys, require two or three times as much mercury to form them into a plastic amalgam, as those which have been some time cut up, whilst the amalgam sets so rapidly that it is most difficult of manipulation.

Some mixtures of precipitated metals, such as silver and palladium, were tried without any satisfactory results being arrived at, but the whole subject is by no means exhausted, and unexpected discoveries may yet be brought to light.

PRESIDENTIAL ADDRESS.

By W. SIMMS, L.D.S.

GENTLEMEN,—It is my pleasing duty to thank you for having elected me President of your Society, and to assure you of the cordial interest which I share with the other members of the Staff in all that pertains to the well-being and well-doing of the Students of the Victoria Dental Hospital.

Although our society has only existed several short years, it has already made itself an indispensable association in connection with Dental Education in Manchester. It will be my desire so to co-operate with your Council, that the value of our meetings shall be maintained, and the success of the Society if possible increased.

We have present with us to-night not only past and present Dental Students, and Members of the Dental Staff, but a goodly number of friends who have found themselves able to take interest in our proceedings. Among these are members of the Managing Committee of the Hospital, who representing the public of Manchester are naturally interested in the work of the Hospital as a charity. The growth of the Dental School; the success of our Students at the various examinations cannot fail to be a matter of great satisfaction to them, (as to us all) as the work of the Hospital as a public charity depends entirely upon its growth as a centre of dental education.

To you all, gentlemen, I am permitted to extend the cordial welcome of the Society, and to thank you for that encouragement which your presence gives to us.

The character of our meeting to-night, largely social as it is, relieves me of the necessity of detaining you by any exhaustive address, but it has appeared to me that there are one or two matters upon which it may not be inappropriate to speak. In the first place it is a matter of great satisfaction that our profession is now at any rate, a closed profession, entrance to which can only be obtained by an examination which is designed as a test of the fitness of a man to practise dentistry; and while we may deplore that there are at present in our ranks not a few who lack the professional

* Read before the Students' Society of Victoria Dental Hospital, Manchester.

spirit, and are in no sense creditable additions to the dental register, we may yet regard these as mere hangers-on, whose very presence will act as a stimulus to further progress. We may well be patient and hopeful as we reflect upon the amazing progress achieved in the short space of the present generation, and we shall not withhold our gratitude to the men, who, coming forth in due time, were ready to uplift our banner and to lead us on to victory.

Quite recently, I had the pleasure of climbing Mount Plinlimmon which rears itself in proud grandeur 2,600 feet above sea level. I was glad to avail myself of a path indicated by frequent posts which some good-natured, but unknown hand, had firmly planted, and by that means to quickly reach the summit without the discomfort of finding myself knee-deep in bogs, or delayed because of the uncertainty of the path. Gentlemen, let us thank those who going before us have at no little loss to themselves halted by the way, and firmly fixed those guide posts to make our dental path more easy, and our hope of reaching the summit of professional excellence the more certain, and when we reach that summit let us not turn deaf ears to that voice which, carried on the wings of the wind, seems to say to us, "Go thou and do likewise."

But the reminder comes to me that only a few of you have reached the mountain-top; you are still patient climbers; some indeed with characteristic hope, only just commencing the journey forwards. I may be permitted, therefore, to point out something which may be learnt by the way; to relieve the tedium of the journey at any rate; perchance to encourage you to keep to the path whence only is safety.

For some time the education of the Dental Student has been a matter of contention between men of different ideas. Your excellent former president, Mr. Geo. G. Champion, has done battle on the side of those who maintain that a higher dental diploma will best meet the progressive requirements of our profession, while there are those, as you know, who think that the possession of the conjoint diploma should be the object of the students' highest hopes. These two schools of thought are irreconcilable, and we may well leave the respective champions to fight out the battle to its issue; we hope, however, to have the assent of both in the assertion, that in your student career there is much to be learnt, which no

examination will prove, or the possession of any diploma attest.

According to Prof. Huxley, "under the best of circumstances examinations will remain but an imperfect test of knowledge, and a still more imperfect test of capacity." (*Science and Culture*, p. 61).

Not, we take it, that an examination is useless, or can be dispensed with, but that there remains the vital question untested : what is a man himself without the stimulus of an examination : what is the spirit he brings to the discharge of his duties ? not merely what is a man's knowledge, but what is his character ?

It has been unkindly said of the Medical Profession that their failures are put out of sight ; in another sense this is true of nearly all the work of the Dental Surgeon, and there is probably no profession where slovenly work may be so easily executed and remain undiscovered—for a time. His work has often to be executed under difficult conditions ; in his operative work he is dealing with organs full of vitality ; he has to overcome the instinctive dread of pain which to many a nervous mind is an excruciating torture ; and yet under these and other adverse circumstances, the good of his patient requires that he should do work which will bear critical examination, work not only good in itself, but good in relation to its purpose. The sight of work ill-done should make him miserable, and the possibility of his doing such work, thing not to be entertained.

While Hospital practice may have its difficulties and objectionable features, it is a splendid school for learning some things which are likely to be important in after life. For instance, the judicious allotment of one's time, so that work may progress smoothly and comfortably, and that the patient's time be not heedlessly lost. It is a necessary lesson that the student sometime has to learn that in crowding several patients into the space of time sufficient only for one, he is acting unfairly to his patients and doing injustice to himself.

Then again, what infinite tact is often required to gain the patient's cordial co-operation in the carrying out of the work in hand, and especially is this so with young children, whose minds are readily and indelibly impressed with the gentleness and patience, or as sometimes unfortunately happens with the callous indifference of the operator.

Very properly the student often looks forward to the time

when he may claim a proper fee for the work he performs. It is, however, a great advantage to him that in his early days his work is done without adequate fee, although I am free to confess, I don't think he often looks at it in this light.

But in the Hospital his satisfaction is in the consciousness of work thoroughly done for its own sake, and for the satisfaction it brings to him ; his patient may not, probably does not, understand all the difficulties of the task; the task for instance of removing all traces of pulp tissue from delicate and almost inaccessible nerve canals ; or the careful shaping of a cavity in a tooth throbbing with vitality; or the laborious building up of a gold stopping; these are things which require doing with thoroughness for the patient's sake, and which bring satisfaction and contentment to the right-minded operator because they are well done.

Will this spirit last when allured by golden guineas, the temptation comes to a man to rush through his work, or execute it in some unworthy way. We may well believe that the value of the student's education will depend upon the answer which can be given to this question.

It is related that Galileo after writing his work, embodying his statement of the laws governing the movement of planets, said: "I have written my book. It will be read, whether in the present age or by posterity, matters little. It can wait for its readers." In a singular spirit may we not encourage the young practitioner on the threshold of his career to do his level best, and unmindful of the unprincipled practices of some, work patiently on, in the full assurance that work honestly executed, will tell in the long run and assert its worth.

Sir H. Davy used to say that he had been kept largely from the temptations of youth, by an active mind, a deep ideal feeling of good, and a *look towards future greatness*.

Gentlemen, I do not believe I have held out too high an ideal for your attainment. I am not only conscious of the difficulties which lie in the way, but of the value of the mental discipline in the attempt to overcome them. If in your quiet moments your imagination takes you to a future which, if not great, has yet by the influence of a blameless life, and of a worthy professional career, earned you the regard of your patients and the reward of a good conscience, I invite you, having a constant look towards *this* future, to so act as that

your life work may be in harmony with your highest aspirations.

“ Life’s more than breath, and the quick round of blood :
 It is a great spirit and a busy heart.
 The coward, and the small in soul scarce do live.
 One generous feeling—one great thought—one deed
 Of good, ere night, would make life longer seem
 Than if each year might number a thousand days,
 Spent as is this by nations of mankind.
 We live in deeds, not years ; in thoughts, not breaths :
 In feelings, not in figures on a dial.
 We should count time by heart-throbs. He most loves
 Who thinks most—feels the noblest—acts the best.”

COORONGITE, OR AUSTRALIAN CAOUTCHOUC.

This is an india-rubber like material, which was discovered many years ago near Salt Creek, which empties itself into the Coorong, and is a salt-water inlet extending from the mouth of the Murray for about 90 miles parallel to and a short distance from the coast of S. Australia. It was first observed on the surface in little hollows in the sand, and resembled patches of dried leather ; it generally occurs in the swamps. The theory formed was that this substance had resulted from the overflow of petroleum or rock oil, and boring operations have since been conducted at various periods, with the view of tapping the oil-bearing strata from which this peculiar substance was supposed to have exuded. The greatest depth of bore attained was somewhere about 500 feet, and so far as is known the beds passed through were tertiary sands, clays, and limestones, resting on blue clay slate. It is understood that a company has recently imported boring machinery from America, with a view of renewing the search for rock oil. There is a wide difference of opinion as to the origin of the substance which has led to these efforts. Some scientific authorities in this country and America ascribe it to a vegetable origin, and regard it as a gum exuding from a plant or a lichen. Other persons assign to it a subterranean origin, but this view is not at present supported by ascertained facts.

Pharmaceutical Journal of Australia.

British Journal of Dental Science.

LONDON, NOVEMBER 16th, 1891.

A LETTER.

"Some months ago, I urged," writes Mr. Morton Smale, "that a dental surgeon should be nominated as a direct representative to the Medical Council." Our readers will remember the letter, which was reprinted in our pages, and may call to mind our comments thereon. Now the opportunity has occurred. The three direct representatives on the Medical Council have to be re-elected, and one might have expected that a dental candidate would be forth coming. But he is not. We are bound to confess that his chances of election would be somewhat small, seeing that the three old representatives are seeking re-election, but it does seem to us somewhat curious that Mr. Smale, who was the originator of the Direct Dental representative idea; who, therefore, may be supposed to have had some firm ground for the suggestion, we say, it seems a little curious that Mr. Smale should now be able to write "considering how well the three gentlemen, who now represent us, have done their duty, it would be unwise to attempt to divide the profession. Mr. Wheelhouse, Sir W. Foster, & Dr. Glover will, I am sure consider themselves the direct representatives of the dental profession, for they certainly will receive the support of all dentists having votes." We are far from saying that the three representatives have not done their duty, of course they have from their point of view, but we cannot help wondering why Mr. Smale

should now consider them such excellent representatives whilst but a few months ago he wrote urging why this representation should be otherwise. However, it matters little, and though this preliminary paragraph may be, in itself, but a very weak peg, it has at any rate served to support some pregnant remarks on other points of dental interest. It will be seen from the letter, reprinted on another page, that three questions are raised. 1. That of covering. 2. The equalization of the examination tests; and 3. The desirability of a five years' curriculum. To take the last first. It is but comparatively recently, when speaking of a paper written by Mr. Campion, that we pointed out that though the nominal dental curriculum is four years yet that for all, except those residing in the neighbourhood of a dental school, it is really one of five years duration. This injustice, we are glad to note, Mr. Smale recognises. It is not as if expense could here be considered as an impediment to enforcing on the town student the same period of study as his provincial brother must now observe. The town student living at home must obviously be at far less expense than one who comes to town and must live from home. But it should be clearly noted that it is not the question of keeping a student such a length of time at the bench which is the main point, but it is ensuring that he shall learn his work and that his master shall teach him. Here is unfortunately the difficulty, and we can see but little hope of its being met, till the student is required to pass a test examination at the conclusion of his apprenticeship. We do not know that we could trust the school authorities to conscientiously carry out such an examination, their interest in obtaining a large entrance list is too much at stake, but we are sure of this, that a school which really imposed such a test before admitting students, would make for itself a reputation to be envied of all. To have been a student at such a school would be its own recommendation. In insisting on a certain standard of examination, the Medical Council have certainly an important duty to fulfil. With dental as with medical examinations, London teachers note with regret the tendency of

some students to go away to other centres to obtain their qualifications. It must in fairness, however, be stated that a test may be fair and yet of a lower standard than that imposed by the English College. We are certainly not for lowering the standard, but it would be a mistake to at once judge another examination as inefficient, merely because it did not come up to this. Herein lies the use of a visitor, who being impartial, would remove the doubt of inefficiency though he might not equalize all the examinations. Though it is impossible to gainsay the advantage which would obtain where there state conducted examination for the whole of the United Kingdom.

It may be remembered that some time since, when writing on the Mortmain Acts, we recalled the curious fact that not only was it illegal to leave land to charitable bodies but it was impossible to bequeath the proceeds of the sale of land. We are glad to note that by a statute passed last session, though it is still impossible to bequeath land (so preventing the accumulation of land in certain hands) it is possible to leave the value of the land. Any land so left has to be sold, and the proceeds devoted to the object as directed by the will.

LONG FASTING PERSONS IN INDIA.—In India, fasts of 30 to 40 days are common amongst the Jains, from amongst whom, 1 once in each year, undertakes to fast 35, 40 and even 60 days. They do this with nothing but warm water to drink, and will die rather than take food during the prescribed period. Quite recently two Jains of Bombay fasted, one for 61, the other for 48 days, at the end of which time having been congratulated by 25,000 Jains who went for the purpose, they recommended taking food in the manner prescribed in their own books and Shastras. On September 22nd, in commemoration of this event, all the chief bazaars in Bombay were closed, and about 5,000 Jains, male and female, fasted all day, while a large sum was spent in securing the release of cows and other animals from the slaughterhouse at Bandora.

GELSEMIUM SEMPERVIRENS.—Dr. C. W. SESSIONS BARRETT, late Honorary Visiting Surgeon, Hunts County Hospital (Hinckley), writes in the *British Medical Journal*, I have found gelsemium a valuable and reliable remedy in non-inflammatory forms of toothache. It is useless in cases of alveolar abscess or marked periostitis. I now prescribe 15 minims of the tincture with 2 grains of quinine, to be taken when in pain and to be repeated every hour if required, not more than three doses to be taken in succession. I have never had experience of peculiar symptoms but twice; in both cases the patients complained that no benefit had resulted until after the third dose, which was first followed by an exaggeration of the pain for a short time, when a sensation as if something snapped was followed by complete relief.

THE facts elicited at the inquest, upon the remains of Mr. Weguelin-Smith, showed that he was to undergo an operation in St. Thomas's Home. Before this he was examined by the anæsthetist, who was struck by his "looking ill." However, the examination showed Mr. Weguelin-Smith, who was only 25 years of age, to be free from organic disease. He was, however, very nervous, and expressed a fear of chloroform. This anæsthetic was given, but when 20 or 30 drops had been administered breathing and the heart's action stopped. All efforts to restore vitality failed. The chloroformist stated that his patient was at no time really under the influence of the anæsthetic, and that death resulted from syncope. This heart failure may presumably be attributed to fear although possibly the chloroform may have acted as an adjuvant in the cardiac depression.

Several members of the Profession having expressed a wish to have copies of Dr. Cunningham's article on "Defective Personal Hygiene as it affects the Teeth," recently published, in order to supply those of their patients who take an intelligent interest in Dental Hygiene, we have reprinted the article in question, and it is now on sale in pamphlet form; for price see advertisement.

Abstracts of British & Foreign Journals

PHYSIOLOGICAL ACTION OF OBTUNDENTS.

By L. E. CUSTER, D.D.S., Dayton, Ohio.

This paper has been written with a view to making clear and harmonizing a few conflicting ideas regarding the action of obtundents of the sensitiveness of the dentinal fibres.

Owing the conflicting theories, it will be fair to assume that this tissue whose sensibility we desire to obtund is of the nature of simple protoplasm, with, in this instance, an exalted sensitive function. It contains albumen, and this is therefore coagulable ; it is made up largely of water, and may be desiccated; it is incased in a tube, and when it does not entirely fill this tube a fluid fills the remaining space. This fluid may be removed, and the temperature of the fibril may be reduced. These are the conditions upon which we are to work.

The dentinal fibril does not possess a blood circulation, and on that account the nutritive movements are slow ; so slow that any agent which produces local anæsthesia in other parts in a few minutes will be very slow in acting to any depth in the dentinal fibril ; so slow, indeed, that we need hardly look in this direction for a practical agent. Cocaine as a typical representative of this class of agents has not been effective for this reason. Any agent which is to act upon the sensitive function of the dentinal fibril must be more powerful than cocaine ; it must not coagulate albumen ; it must have an affinity for water ; it must possess a penetrating property, and insinuate itself into the tubule, for it will not be carried in by circulation and but very slowly by any nutritive movement. Until we find an agent possessing these qualities, we need not expect to obtund sensitive dentine by suspending the fibril's irritability.

The most satisfactory results have been obtained in other directions. The dentinal fibril has a definite composition. The elements of all the proteids are in a definite proportion, and we have reason to believe that the proportion is very delicately balanced. If the structure of the fibril be changed, its irritability ceases and it can no longer communicate sensation.

The change of structure most easily accomplished is the coagulation of its albumen and the withdrawal of its water. If the albumen is coagulated, it is as effectual in checking neural movement as though the albuminous ingredient had been withdrawn; indeed, the coagulation of albumen itself renders it harder, and its presence would prevent any exhibition of life more readily than if it were removed.

The coagulation of albumen, unless produced by heat, is somewhat self-limiting, so that since heat of 160 deg. F. is not allowable for sensitive dentine, the action of present known coagulants is not entirely satisfactory. Before coagulation can be a practical success, we must have an agent which penetrates to some depth.

Penetrating escharotics, such as arsenic and the like, since they burn the tissue beyond recovery and endanger the pulp, should not be considered.

The other method of changing the structure of the dentinal fibril is by the removal of the water. The water holds a two-fold relation with the fibril,—that which is a constituent of the fibril itself, and that which fills any inequalities between the fibril and Neumann's sheath. One is a constituent, and the other a condition. The water which is a constituent is always present; it is always found where life and motion occur; it is always a necessary condition for neural activity; it makes up three-fourths of the entire body and about ninety per cent. of the dentinal fibril. Constituting such a large proportion of the fibril, it is evident that there would be a proportionate change in the structure and physical character if the water were removed. The size would be decreased, the albumen if coagulated would become harder, and in this desiccated condition it would be practically dead, incapable of performing nutrition and function.

The water which fills any inequalities between the fibril and its investments may be accessory in the transmission of sensation. In this relation it may transmit vibrations to the fibril or even to the fibriloblast. One of the most delicate nerves of special sense, the auditory, receives its impressions through the embolymph in which its terminals float. So if the water surrounding the fibril should be removed, the fibrils transmitting power may be affected.

The watery contents of the tubule are withdrawn by evaporation and by bringing an agent in contact with it for which it has an affinity. Evaporation is produced by raising the tem-

perature and subjecting to a current of air. This is practically accomplished by the repeated blasts from a hot-air syringe. The water surrounding the fibril is comparatively easily abstracted, but to loosen the molecular grip in the fibril itself requires more force. There are many agents which have an affinity for water, but not all are suitable for use in the cavity of a tooth. The agents most desirable for this purpose would be alcohol or glycerine. Alcohol possesses a property different from glycerine which makes it valuable: it is volatile. Water is taken up by the alcohol and evaporates with it. Of course the affinity is increased the nearer the alcohol is absolute.

The water is more thoroughly withdrawn when the two principles, affinity and evaporation, are employed together.

As compared with coagulation as a means of changing the structure, dehydration is more thoroughly accomplished with the present known methods, and hence the results are more satisfactory; so much so that I suppose the majority of operators use dehydration almost entirely as a means of obtunding sensitive dentine.

If we use a combination of the two methods of change of structure,—desiccation followed by coagulation,—we will secure more profound results. As a proof of the truth of this statement, we have an agent which when used on sensitive dentine both withdraws the water and coagulates the albumen, and a more effective single medicament for sensitive dentine we have not. This stands alone and at the head of the list as a practical, efficient, and I may say safe agent as an obtundent. I refer to chloride of zinc,—not a fluid when its affinity for water has been satisfied, but a crystal which will deliquesce when placed in the cavity.

The last method by which the fibril's transmitting power may be lessened is by changing the temperature. This is of value as an obtundent of sensitive dentine on the same principle that it acts upon the soft tissues. As a condition for the perfect performance of nerve function, there must be maintained a certain temperature which is normal to the organism. If that temperature is lowered, neural activity is lessened somewhat proportionate to the departure from normality, so that there may be a point reached where complete anesthesia is produced. Of all the obtundents of sensitive dentine, extreme cold is the most effective; not that it is any better than perfect coagulation or dehydration, but because the tempera-

ture of dentine may be reduced more thoroughly than the albumen may be coagulated or the water withdrawn in ordinary practice. This is because of the distance of the bulbous portion of the pulp from collateral circulation, there being no blood-circulation in the dentine, the ease with which the crown of the tooth may be isolated from surrounding sources of warmth, and also because we have refrigerating agents so simple and effective in their action that they may be made to act even beyond the necessities of the case.

The reduction temperature is best accomplished by the use of volatile agents, such as sulphuric ether, chloride of methyl, rhigolene, or nitrous oxide.

It has been claimed for ether and nitrous oxide when used upon dentine that they act by abstracting the moisture. If we substitute the word *heat* for *moisture*, their action will be correctly stated. It is a mistake to attribute the action of the above agents to any water which they may withdraw, for these are cold-producing agents, and it is contrary to the laws of physics to produce evaporation by lowering the temperature; so that water cannot be withdrawn by these agents unless there is an affinity, which with ether there is none, and with nitrous oxide the temperature is lowered so rapidly that the water is frozen before any quantity could be removed by affinity. Any agent which reduces the temperature opposes evaporation or any chemical action upon the tubular contents. All such agents obtund sensitiveness in but one way, and that is by reducing the temperature.

It will be observed from the foregoing that the function of the fibril may be completely suspended by coagulating all its albumen, by withdrawing all its water, or by lowering its temperature to a certain point. But the entire coagulation of its albumen is practically impossible at present, the entire removal of its moisture almost impossible, and the reduction of temperature is the only one which acts to any desired depth. So theoretically, and it has been found practically, that, except arsenical preparations, refrigerating agents are the most effective obtundents of sensitive dentine allowable.

Recently there have been introduced three new methods having the same principle of action which are misleading. The thermal obtunder of Small, the Milton obtunder, and the Richmond obtunder are instruments and methods which use an elevation of temperature and the vapour of an alcohol or an essential oil, or a combination of these, upon the dentine.

There is a silent claim in all these that there is a specific action of the vaporized agent upon the conductivity of the fibril, otherwise why use anything but the jet of hot air itself?

The effect of throwing a warm or hot blast upon a tooth is to heat it. By heating the dentine evaporation of its moisture takes place. The fibril dries up, and there is an outward movement as the water vaporizes and escapes from the tubule. No medicine can possibly enter the tubule during this time unless it has an affinity for water. When an oil or any agent which has no affinity for water is used in these methods, it will be apparent how utterly useless it is. Then the oil is not applied in its liquid state, but in a vapour. Is the vapour of the oil of cassia more powerful than the liquid form in preventing the development of micro-organisms? What virtue can possibly be attached to attenuation, that the liquid must be vaporized? Power lies in concentration. What effect can a vapour have upon the dentinal fibril if it simply fills the cavity of the tooth? In order to be effective it must condense and enter the tubule before it can come in contact with the fibril, and this cannot take place when it is applied with heat.

The application of a vaporized agent in a warm or hot blast is essentially one of *desiccation*. The heat is the only virtue in this unless the agent has an affinity for water, when it may aid in carrying off the water vapour. The vapour of alcohol is effective on this account, and I think those who have recommended the use of oils or any agent which has no affinity for water are labouring under a delusion.

Unfortunately, the agents which are most effective are most dangerous to the pulp, and in our selection of an agent for the case at hand this is to be borne in mind.

Cosmos.

THE MEDICAL COUNCIL AND "COVERING" IN THE DENTAL PROFESSION.

To the Editors of THE LANCET.

Sirs,—

Some months ago I urged that a dental surgeon should be nominated as a direct representative to the Medical Council;

but considering how well the three gentlemen who now represent us have done their duty, it would be unwise to attempt to divide the profession. Mr. Wheelhouse, Sir W. Foster, and Dr. Glover will, I am sure, consider themselves the direct representatives of the dental profession, for they certainly will receive the support of all dentists having votes.

There are two or three matters of importance that the dentists of Great Britain would urge ;—1. That similar regulations to those now existing in the medical profession in the matter of “covering” should be instituted for the dental profession. Such regulations are much needed, because a large number of registered dentists have branches in various towns and “cover” unregistered practitioners, greatly to the injury of the public. A similar practice exists also in the matter of deceased dentists, whose executors and widows carry on the practice by the use of unregistered men, such class of men necessarily being able to work for smaller remuneration. 2. It is within the power, if it be not a positive duty, for the General Medical Council to send visitors to the various examinations held by the Colleges in Great Britain and Ireland for the purpose of granting the Licence in Dental Surgery. Some of these bodies appear to grant their licence upon rather easy terms *sine curriculo*, and consequently diminish the value of the diploma granted by the other bodies. A visitor appointed to visit the various examinations in Great Britain and Ireland might probably stimulate the pass standard of all the Colleges. 3. With regard to the dental curriculum, those gentlemen who have the good fortune to be apprenticed in a town where there is a dental and general hospital, can, by a process of overlapping the hospital career and the apprenticeship, obtain the diploma in four years, while those apprenticed elsewhere cannot obtain it in less than five years. This is hardly fair to provincial men. Two courses seem to be possible : viz., to make the apprenticeship two years instead of three, which I should very much deprecate ; or to increase the period of study to five years, so that nobody could obtain the diploma until five years had elapsed after registration as a student.

I venture to hope that not only the direct representatives but the general body of the Council will do us the honour to consider these questions.

I am, Sirs, yours faithfully,
Cavendish-square, W.

MORTON SMALE.
(*Lancet.*)

“THE SUPPOSED CURATIVE EFFECT OF OPERATIONS *PER SE*.”

By A. ERNEST MAYLARD, B.S.

OF something more than passing interest is a paper by Professor J. William White, of Philadelphia, which has recently appeared in the August and September numbers of the *Annals of Surgery*. The subject of the paper is, perhaps, best conveyed in the author's own opening remarks. He says:—"For some time I have had the idea of collecting and analysing the various cases recorded in the journals and elsewhere, in which intelligent surgeons, having operated for the relief of symptoms depending upon a supposed pathological basis, have found no such condition, and yet the patient recovered, not only from the operation, but from the original ailment." The author then passes on to consider--first, the recorded cases, and, secondly, the possible explanation of the phenomena observed.

There can be but few surgeons who have not, in the course of their experience, had cases which recall results similar to many that are referred to here. To operate and find nothing, and yet the patient to be relieved of his symptoms, is sometimes strange enough; but more mysterious still, are those cases where something is found, and where the surgeon honestly feels that nothing that he did seems sufficient to explain the cure that has been effected. After reading such a paper as that here referred to, the temptation almost lingers in the surgeon's mind that no protracted case, either obscure in its symptoms, or even obvious in its signs, should be allowed to pass without some tentative surgical measure. There is something as mysterious almost in contemplating many of these results as there is in considering the cases which are now said to result from the therapeutical use of hypnotism. It is, of course, quite possible that many results obtained in both cases are effected through similar internal agencies, and with this Professor White deals more extensively later. But the difficulty of explanation can hardly be said to be easier in the one case than in the other. For while certainly the distance between cause and effect seems often far enough in hypnotism, it cannot be said to be any

closer in cases where one epileptic is cured by castration and another by tracheotomy.

The major part of the first portion of Professor White's paper (August number) is mainly taken up with a consideration of these epileptic cases. From various sources the author has collected 154 cases where operations were performed, and in which little or nothing was found to account for the symptoms, but either marked benefit or cure followed. The operations performed were various. The larger proportion, however, were cases of trephining; thus, in 56 cases where this operation was performed, and nothing abnormal was found to account for the symptoms, 25 were reported as cured, 18 as improved, and only 3 showed signs of relapse later. It should be noted that in nearly all these cases the cause of the fits had been some injury to the head, although, from the tables given it also appears that some were idiopathic in character.

The operation of ligating large arteries, as the vertebrales and the carotids, was performed in 30 cases, and, judging again from the tables, these apparently were mostly of an idiopathic character. Fourteen of these cases were reported as cured, and 15 as improved. Castration was performed in 10 cases and tracheotomy in 9, and cures were effected in each instance. Many other operations are given, both severe and simple, and with results as difficult to explain as those above indicated.

Following upon these epileptic cases is a series comprising cases of abdominal and pelvic disorders. Of these, it may be said that diseases of the most diverse character have been relieved, if not cured, by apparently ineffectual operative measures. Thus, we find simple laparotomy (*i.e.*, nothing more than opening the abdomen) performed with success for tubercular peritonitis, pain in the stomach with persistent vomiting, distressing renal symptoms, intestinal obstruction, severe localised pelvic pain, supposed pyosalpinx, large fibroid tumour of uterus, pelvic adhesions, obscure hepatic symptoms with jaundice, and many other conditions. As a sub-division of this class are operations upon the genito-urinary tract. Of these, the most striking are operations for supposed kidney calculus, where nothing has been found to account for the symptoms, and yet the result of the operation has been their entire disappearance.

In attempting to offer some reasonable explanation of the phenomena observed in the above cases, Professor White

considers those conditions which were common to all, or nearly all, of them. These were—

1. Anæsthesia.
2. Psychological influence, or so-called mental impressions.
3. Relief of tension.
4. Reflex action, or the “reaction of traumatism.”

The first is briefly dismissed from the fact that it was tried experimentally on numerous cases with negative results.

In considering the second influence—that of psychological influence or mental impression—the author pertinently asks—“Is it possible, through influences acting upon the emotional and intellectual nature, to affect the organic processes of secretion, nutrition, &c., and if so, is it conceivable that through the same influences pathological changes may be arrested and reparative or curative action established?” The reply he gives is in the affirmative. But its application as a complete and satisfactory explanation, in the present instance, is to some extent insufficient from the fact that it is impossible to make it—i.e., psychological influence, account for the curative effect of operations *per se* on imbeciles; that healthy-brained people should be influenced by operations is only reasonable to assume, as there is abundant evidence to show that they are affected by numerous other influences. In these purely psychological effects, then, there can be but little difference between the internal agencies brought into play to produce a cure, on the one hand, by a surgical operation, or, on the other by the subjective influence of hypnotism; and any explanation which can be found to throw light on the one must similarly elucidate the mode of action of the other.

The third condition—relief of tension—can only be said to exist in certain of the recorded cases. Where tension has by operation been unquestionably relieved, it is quite reasonable to assume—as the author does—that such relief must be accompanied by other changes in the surrounding parts and that these changes may result in a return of the parts to a normal condition. The only question which may fairly be asked here is—whether it is right to include such cases in the category of those especially under consideration. To relieve tension is a most common and important surgical procedure; and, where such relief entails a cure, the operation however simple, must be considered in the light of any other well directed surgical measure. This theory, then, while it reasonably explains many apparently mysterious results, cannot be

said to throw any light on the epileptic cures by trephining. Gowers appears to think that the good result obtained in these cases is due to the escape of pent-up serum ; but the escape of serum is but a rare concomitant, and if a cure result where no such obvious cause of reduction of tension exists, it can hardly be accepted as a likely explanation. A more reasonable, although it must be confessed by no means clear, explanation is possibly found in the fourth condition which the author describes—that of reflex action. Under this head is included the “reaction of traumatism,” as well as the effects of revulsion and counter irritation. This theory is based on the reciprocal influence which is frequently seen of one portion of the body on another in both health and disease. Thus the inexplicable relationship between mumps and orchitis—between a burn and a duodenal ulcer. The one condition is not frequently associated with the other, but what constitutes the connecting link is an unsolved problem. So it seems reasonable to suppose that the one influences the pathological condition of another as to bring about a curative result. To produce an injury forcibly suggests to one’s mind the homœopathic dictum, *Similia similibus curantur*. In further support of such an explanation, that certain unknown influences can bring about curative changes, the author adduces cases reported by Drs. Gairdner and Coats and Sir James Paget at the London Pathological Society, in April, 1879. These were cases of the disappearance of tumours, in some instances of an undoubted cancerous nature.

While thus endeavouring to offer some explanation for the otherwise inexplicable good results of an operation *per se*, Professor White concludes with a caution regarding the possible danger of considering as mysterious what really can be accounted for by the operation itself. Thus, in many abdominal operations, what is called a simple laparotomy may unknowingly comprise in its performance manipulations which may break down some slight adhesion or empty a pyo-salpinx into the uterus, &c. But, with all precautions to exclude such class of cases, there still remains a very large residuum which must be relegated for the present to the realm of mystery.

Professor White has had an arduous task in collecting the material which he has made such good use of ; but the interest, not to speak of the intrinsic value, which attaches to the subject must have rendered it no unpleasant duty, and the result will be highly appreciated by all who read his valuable paper.—*Glasgow Medical Journal*.

FOREIGN BODY IN THE BRONCHUS.

WESSINGER (*New York Med. Journ.*, September 12th) records the case of a boy, aged 13, who, having put some brass-headed tacks into his mouth, inhaled one into his trachea, whence it passed into the left bronchus. He was seen by a doctor soon afterwards, when he was found to be suffering from spasm of the glottis, dyspnoea, cyanosis, incessant coughing, and a frothy and slightly blood-tinged expectoration. In a few days the symptoms of irritation passed away, and he seemed to have perfectly recovered. A year later he came under Dr. Wessinger's care; he appeared robust and healthy, but had a slight irritative cough. On examination an area of dulness, 2 inches in diameter was detected to the left of the sternum, in the region of the bifurcation of the left bronchus, with pain on percussion; the breathing here was weak and somewhat bronchial. The opinion was that the foreign body was still exactly where the former medical attendant had believed it to be. Six months later during a fit of coughing the tack was expelled embedded in a dark, hard, grumous substance. The physical signs, cleared up a good deal after this occurrence.

British Medical Journal.

TREATMENT OF TEETH AFTER WEDGING.

The gingivæ require careful treatment after wedging, and after the use of ligatures, clamps, etc, it is best to use a soothing application such as a mixture of carbolic acid 95°, 6m. Tinct. iodine, 45 m. Glycerine, 1 oz. Distilled water, 5 ozs., or when pulps have been removed of aconite and iodine equal parts to check the after pain or inflammation of the peridental membrane. If we can get along without, we prefer a little crowding or wedging of the gums in scrofulous patients as is possible, for once separated from the necks of the teeth they may not return to a firm union, and healthy teeth require healthy gums.—Dr. A. W. FREEMAN.

Ohio Journal.

Selection.

THE CROONIAN LECTURES.

On the Progress of Discovery Relating to the Origin and Nature of Infectious Diseases.

Delivered at the Royal College of Physicians, London.

By J. BURDON-SANDERSON, M.D., Ed., F.R.S., &c.,
Professor of Physiology in the University of Oxford.

THE ETIOLOGY OF INFLAMMATION.

GENTLEMEN,—The task which I have undertaken—that of giving an account of the progress of knowledge relating to the origin and nature of infectious diseases (and of late this has come to mean *acute* diseases), and the growth of this knowledge during the twenty years which have elapsed since I entered on the study of the subject—is one which I feel myself incompetent to discharge in a manner which will be satisfactory either to myself or to my audience. But the desire of the President that I should attempt it was conveyed to me in such terms by Sir Henry Pitman that although I should rather it should have been undertaken by a younger man, refusal seemed difficult, and at once became impossible when enforced by the direct command of the President. It is in obedience to this command that I come before you once more as a lecturer. I accept the task with gratitude. I think I may say with truth that I was once a working pathologist. The game is now in other hands. The time must come to all of us when we must give up to younger men the real work of investigation and find our pleasure (as happens constantly to me) in being instructed by our own pupils in the very branches of knowledge the elements of which we have ourselves taught them.

I trust that it will be understood that I do not intend to lecture here on bacteriology, and that these lectures are not intended for bacteriologists. My subject will be infective diseases and their causes. Of “microbes” or “micro-organisms” I shall speak, not as plants, but of exciters of disease, and deal with them as they are known to the experimental

pathologist, not as they are curiously contemplated by the naturalist. My main purpose will be to show that, notwithstanding the apparent revolution which has taken place in our science in consequence of the discoveries of the past generation, the very ideas which were now dominant, especially those which have the best claim to acceptance, are, in so far as they are true, developments of ideas which were present to the minds of thinking, working pathologists a quarter of a century ago. The present course consists of four lectures, but the subject more naturally divides itself into three than into four. I shall therefore devote the first three to two subjects—namely, (1) the causes of acute diseases and their mode of operation; (2) the reaction of the organism (of man or of the higher animals) against the operation of morbid agents. The fourth lecture will relate to specificity—*i.e.*, the relation between the distinctive characters of specific diseases and those of the specific causes which produce them. It will be my aim to direct the attention of those who may do me the honour of attending the lectures rather to the great pathological questions which now occupy the thought of pathological workers than to details, which, however essential they may be as bases of inference, are difficult to seize upon in the course of a lecture—asking you to accept my assurance that, when the time comes for publication, I shall state these details fully in the form of notes or appendices.

To-day I propose to discuss the etiology of inflammation—*i.e.*, the mode of action of those microphytes, although morbid, which do not produce the diseases commonly called zymotic. I begin with the etiology of inflammation, because the doctrine of inflammation has ever been the pivot upon which pathological doctrine on other subjects has turned. Another reason is, that when I last had the honour of addressing the College the etiology of inflammation was my subject. Since that date large additions have been made to our knowledge. Much that was then surmise is now certainty, and many of the conclusions which had then been drawn from the results of experimental investigation have since acquired a wider meaning. I trust, however, I may be able to show you that, on the whole, the view of the subject which I then presented (substantially the same as that which I had given in my article in Holmes' "Surgery" in 1871) is the true one—that it requires to be extended rather than corrected. The definition of inflammation which I then gave—namely, that

it is the response of living tissue to injury—still holds good, and probably will in all future time express what is meant by the word in pathology. In defining a morbid process it is not only necessary to set forth those characteristics, which are well ascertained and constant, but to draw attention to those which are as yet subject to question or require further investigation. The use of the words *injury* and *reaction* suggests three questions, all of which are fundamental. What is the nature of the reaction and what of the damage which produces it, and what are the external causes or noxæ of which the damage is the expression? These are the old questions which we have been asking ever since Simon discussed the subject in the first edition of the work I have referred to in 1860.

Noxa, Damage, Reaction.—In this climax it is the first step which at this moment specially concerns us; but we cannot discuss the agent except in relation to its effects. The etiology of inflammation cannot be considered irrespectively of the process.

PART I. *Origin and Development of the Doctrine of the Infective Nature of Inflammation.*—Up to the year 1860—that is, ten years before the beginning of the period to which these lectures specially relate—it was assumed without question that whenever inflammation occurs in consequence of an injury, whether chemical or mechanical, the *apparent* cause of the morbid process is the real one. Since that time it has gradually become clear that in the majority of instances this is not so; and that, however direct and simple may be the relation between the damage done and the reaction which follows, the result does not occur unless there be present at the seat of injury another condition—something analogous to the contagia which are the acknowledged indispensable agents in the production of specific diseases. So that in all these cases we have to distinguish between the contagium or proximate cause and the mechanical or chemical injury by co-operation of which it is enabled to act. Now, the pathologist who first referred to contagium as an element in the causation of inflammation was John Simon. In the article* to which I have referred he adduced many striking facts derived from clinical experience for believing that it is “a generic and essential property of inflammation that its actions (some of them) are always in their kind, to some

* See article Inflammation in System of Surgery, Vol. I.

extent contagious." The most important of these facts were the readiness with which conjunctivitis can be produced by the introduction into the conjunctival sac of any kind of inflammatory product where there is no mechanical or chemical irritation, the production of disseminated inflammations by intravenous injection of perfectly healthy pus, and in general all those cases in which traumatic inflammations—such, for example, as that produced by running a splinter of clean wood into the finger—give occasion to inflammation of the corresponding lymphatic glands. All such instances seemed to Mr. Simon to indicate that non-specific, clean, uncontaminated inflammation are more or less spreading or contagious. It was, however, clear to him that, even were it admitted that the property of contagiousness is generic, there must be a difference between common and specific, and he endeavoured, in so far as possible, to indicate its nature, referring particularly to the much greater dependence of specific contagia on individual proclivity and susceptibility, and to that antagonism between pus corpustles and specific contagi which has of late years received its recognition in the phagocyte theory of Metchnikoff. In 1870 Mr. Simon, in republishing the article from which I have quoted, recognised in a note the probability that the doctrine which had a little before been set forth by professor Hallier, that specific "contagia are in their essence living microphytes," was true. In my own essay "on the process of inflammation," which formed part of the article "Inflammation" in the same edition of the "System of Surgery," I differed from Mr. Simon in not regarding contagiousness as a property of common inflammation, but as distinctive of certain inflammations to which, on this ground I applied the term "infective," or "secondary." As to the nature of the infective element contained in the exudation products of such inflammations. I was unable to say more than that they consisted of "particles of matter of the nature of which we can assert nothing except that they are of extreme minuteness, are conveyed from a primarily inflamed part to other parts previously healthy, and there become foci of infective induration or suppuration, each of which is the product, if one may be allowed the expression, of a single seed."* But at that very time we were on the eve of great advances of knowledge. The next year a very extensive

* Holmes' System of Surgery, ed. 1871,

series of researches was conducted by Dr. Klein and myself relating to what we then called "secondary inflammations," in which we observed the fact that the presence of micrococci in groups or chains, as well as rodlike microphytes, was so characteristic of all such suppurations, that we had no doubt that it was to them that these products owed their infecting character. As to the morphological characters of these microphytes we had no means of judging; they were designated as chains or groups of spheroids.

During the next few years many investigations, chiefly experimental, were made which served to throw light on the part played by microphytes in the causation of inflammation. In 1873, Chauveau made an experiment, of which I gave a detailed account in my former lecture, which was of fundamental importance. The operation of *bistournage* which is used in France for economic purposes as a means of arresting the circulation in the testis by torsion of the spermatic artery and annulling the function of the organ in animals destined for the shambles, is never known to be followed by any inflammatory reaction, notwithstanding that the part is subjected to considerable violence. But if the animal is "prepared" by intervenous injection of microphytes derived from the pus of an infective abscess, the contamination of the blood which the organs contain at the moment that its circulation ceases, converts the ordinarily harmless manipulation into one fraught with danger to life in consequence of the intensity of the local reaction which it produces. Subsequently Professor Kocher of Berne showed still more conclusively that the most severe injuries of bone—such, for example, as the destruction of the medulla by the actual cautery, or the introduction of caustic potash or croton into the medullary cavity—produced no suppuration under normal conditions, but that this effect might be determined at will by subjecting the animal to what might be called a septic regimen—i.e., feeding it on putrid food. These and other similar facts served to make it extremely probable that organisms which, in the absence of more exact knowledge which we now possess, we designated septic, were also at the same time "phlogogenic," i.e., possessed the power of determining suppurative inflammation when it would not without their intervention have occurred. But no proof was at that time given that they were capable of themselves of producing inflammation, or that they could exercise this power when

separated from the inflammatory products in which they had vegetated. As regards the organisms which, under ordinary conditions, infect the common media of our environment, in the suspended moisture of the atmosphere, and the moist surfaces of all exposed objects which have not been sterilised, they had indeed been shown to be not only morbidic, but wholly innocuous. Wesener, in a research of which I also gave an account in my former lecture, showed that cultivating liquids charged with these ordinary saprophytes could be injected in large quantities into the peritoneal cavity without producing any reaction whatever, provided only that the quantity so introduced was not too large to be disposed of by the efficient mechanism for absorption with which the peritoneal cavity is provided. On the other hand it was found that if water were introduced into the peritoneum in such amount that it remained unabsorbed for several hours, death occurred from septic peritonitis, although no putrescible liquid had been used. Why this happens is easy to understand. The liquid becomes by diffusion charged with the soluble constituents of the blood, so as to resemble diluted serum, a liquid more suited for the rapid development of septic organisms than serum itself. The result is that the animal dies very rapidly of septicæmia. A process of inflammation is set up in the peritoneum, the surface of which is found at death to be lined with false membrane, while its cavity contains a fluid which is charged with leucocytes and teems with septic organisms, which last also plug the lymphatics of the diaphragm and are found in numbers in the circulating blood. The inference to be drawn from these facts is obvious ; but I do not know that even now the facts are so thoroughly impressed on the minds of pathologists as their importance demands. May I repeat that inference in the same words I used ten years ago. "Air enclosed in a serous membrane is harmless, water is harmless, septic organisms are harmless, provided that they are rapidly absorbed. The one thing fraught with danger is that liquid which is undergoing the process of putrefaction should remain in a cavity which, although it is *inside* of the body as regards temperature, is yet *outside* in so far as it is beyond the reach of living tissue." In order that "germs" may have the opportunity of doing their fatal work there must be, in contact with the living tissue, non-living soil in which they can vegetate. Ordinary saprophytes are not themselves toxic, but act by the

toxic products to which they give rise in the soil in which they grow ; if that soil is wanting, the products cannot be developed.

I have now brought you, as regards the question of the dependence of inflammation on microphytes, almost to the point which had been arrived at at the date of my last lecture. In certain cases there was strong reason for believing that the origin of the process of inflammation was microphytic ; but, on the other hand, it was certain that although the essence of the antiseptic treatment was supposed to consist in the exclusion of air-borne germs, such germs were, in themselves, absolutely harmless. The only way of reconciling these apparently contradictory principles was to be found in the hypothesis that among the organisms grouped together under the general term septic or non-specific, there were some which were endowed, not merely with the faculty of determining sepsis, and therefore capable of producing septicæmia if brought into relation with exuded liquid or effused blood enclosed within a living tissue, but were possessed of the power of injuring and damaging protoplasm. In support of this hypothesis the only facts were those which were derived from certain forms of infective inflammation, which I at that time designated to you as "cryptogenetic," a term which I borrowed from the late Professor Hüter. The term is one which does not need explanation. The type of such inflammations is the primary inflammation of the marrow or spongy tissue of bone, to which young people are liable without any assignable cause, and which in too many cases gives rise to, or is associated with, secondary foci of inflammation, either in other parts of the skeleton or in internal organs, attended with the constitutional symptoms of pyæmia. Another typical case of infective or disseminated inflammations coming into existence "cryptogenetically" is that in which pyæmia supervenes on valvular disease, without its being possible to suppose that any infective material has been introduced from without. Now in these two cases the secondary lesions are of the same nature, though they differ in distribution, the most characteristic being the miliary abscesses, each surrounded by a border of hyperæmia, which are found in the medullary and cortical part of the kidneys, and appear to be due to the plugging of minute arteries. As regards all these secondary foci, whether their embolic origin could be made out or not, it was ascertained some

fifteen years ago that they were characterised by the presence of aggregations of spheroidal microphytes, which ever since Hallier we call cocci, and which under the microscope were clumped together in groups or colonies, which did not exhibit any definite arrangement. Considering that in these cases the microphytes in question must have come into existence and have grown under very special conditions, and that, however simple their morphological characters were, they were remarkably uniform, and that the pathological appearances were such as to indicate that they acted not merely as foreign bodies, but possessed the power of exercising an injurious or disintegrating influence on the elements of living tissue with which they came into relation, pathologists thought it reasonable to attribute to them *special* pathogenic properties differing from those of ordinary saprophytes. Had I been asked in 1880 to define my position, I should have said those inflammations which are most characteristically infective are associated with organisms which, so far as we can make out, are *peculiar*—i.e., are not ordinary saprophytes. Are they specially phlogogenic? This question we could not answer them; we can now.

PART II. *Discovery of the Specific Forms of Phlogogenic Microphytes.*—Such, then, was the knowledge we possessed up to the year 1880, and now we come to a new departure in the history of our subject. This new departure consisted, first, in the demonstration that in all ordinary cases of acute suppurative inflammation, whether infective in the sense used by me in 1872 or not, the purulent product contains microphytes which are special to it; and secondly, in the application of the methods with which about that time Dr. Koch had enriched pathology for separating species of microphytes from each other and obtaining pure cultures. It is gratifying to say that we owe the demonstration that all acute inflammatory products contain characteristic forms of microphyte to an English, or rather Scottish, pathologist, Professor Ogston of Aberdeen.* For the working out of the phytological characteristic of Dr. Ogston's organism we are no less indebted to Professor J. Rosenbach of Göttingen. The two researches may be referred to in connexion with each other, provided that it is borne in mind that Ogston was first in the field.

* Ogston, report on micro-organisms in surgical diseases. Brit. Med. Jour., 1881, p. 369.

Ogston found that in the pus of acute abscesses the spheroidal microphytes, which are always present, and partly in chains or chaplets, and partly in collections, in which the grouping of the individual spheroids resembled that of fish roe, or that of grapes in a bunch. This comparison led him to adopt as a name for the organism the term "Staphylococcus," which may be conveniently Englished as "Cluster-coccus." He found that in sixty-four acute abscesses, all contained micrococci of some sort, seventeen contained only chains, thirty-one only clusters; in the rest both were present. Both of these organisms were found to be capable of producing localised inflammation resulting in abscesses when liquids containing them were injected subcutaneously; but it appeared that the character of the abscess differed in the two cases, the cluster coccus producing a well-circumscribed abscess, whereas the chaplet-coccus (which, following Billroth, he called "streptococcus") always found its way from the inflammatory focus into the lymph paths leading from it. Nothing can be more interesting than the description which Ogston gives of the structure of a typically limited abscess in its early stage—*i.e.*, four days after the subcutaneous injection of a drop of cluster coccus culture. A nodule exists under the skin of which the centre is yellow pus; then comes the pyogenic membrane, infiltrated with leucocytes and invaded by masses of staphylococci; and outside of this a zone of injured tissue, in which the elements have lost their distinctness but scarcely any microphytes are to be seen.

That so accomplished a pathologist as Dr. Ogston was able to make himself sure of the fundamental fact—*i. e.*, the existence of cocci in all acute abscesses—and to state numerically the prevalence of each in the cases which came under his observation, was due to his having taken the trouble to make himself master of the best technical methods which were then known. In like manner, Rosenbach's success in investigating the generic characters of staphylococcus and the distinctions of the two species, *aureus* and *albus*, would not have been achieved had not Koch discovered the method of culture on solid media. A staphylococcus culture can be obtained by sowing pus in which it is growing on the surface of a suitable solid medium, solution of meat peptone, to which agar enough has been added to enable it to gelatinise, and remain solid at the temperature of the body. This is effected by streaking the surface with a sterilised platinum loop which has been

charged with pus. In twenty-four hours a linear opacity shows itself in the position of the scratch, which soon acquires the appearance of a streak of yellow paint. If the staphylococcus were sown on nutrient jelly instead of on agar, it would liquify it, so that in a short time the yellow crust would fall to the bottom. Staphylococcus is one of those microphytes which does not want air, and will grow without it, but requires oxygen for the development of its characteristic colour. It is capable of digesting cooked meat and converting it into peptone, but it has a tendency to produce the ulterior chemical changes which are characteristic of putrefaction. The cocci are very minute, so that although we used to be able to make them out in pre-Kochian days, we could never be quite sure what we were looking at. There is no difference between the two species of cluster-coccus either as regards the size or grouping of the organism. The only distinction between them is that one is in mass golden yellow, the other opaque white. Such is the *prima facie* case established in 1883 by Rosenbach in favour of the yellow cluster-coccus, or, as it was also at that time called, the osteomyelitis coccus. The reason why it received the latter destination was that about the same time that Rosenbach was working with it Dr. Becker published a preliminary communication, in which he gave that name to a micrococcus which he had obtained in a state of pure culture from the pus of infective or dyscrasic osteomyelitis, and which he regarded as the specific cause of the disease. So that although Rosenbach appears to have been the first to recognise the casual relation of the microphyte to suppuration, Becker has a fair claim to be regarded as a discoverer, inasmuch as his description was the one first published. It was not, indeed, until 1884 that Rosenbach's well-known monograph was published. But in the meantime the *clinical* fact of the almost constant presence of the microphyte in the products of acute inflammation, and the *experimental* fact that it is capable under favourable condition of producing localised suppuration, had been accepted with even too much confidence as well-established facts in pathology. At that time the question of the etiology of suppuration identified itself with that of the pathogenic properties of staphylococcus, almost as completely as if the relation between it and the process of inflammation were no less specific than that which subsists between anthrax and the bacillus which causes it. What we have now therefore

to do is to inquire what the real value of the clinical and experimental facts I have referred to is. We shall find that the question is by no means so simple as at first it seemed, and that, although during the seven years which have elapsed since Rosenbach's book appeared, the literature of the subject has assumed very large proportions the question of the true relation between process and microphyte has scarcely even yet been elucidated. Before we proceed to the examination of this evidence, I must remind you parenthetically that, although the cluster-coccus is the most important of the microphytes which appear to have to do with the suppurative process, Rosenbach designated three other organisms, in addition to streptococcus, as having subordinate claims. But it will be most conducive to the purpose we have in view to confine ourselves as far as possible to the pathogenic properties of the yellow cluster-coccus, bearing in mind that no sort of microphyte has any interest for us whatever, excepting in so far as it can be proved a mischief-maker. We regard these things not as naturalists, but as pathologists.

PART III. *Lesions produced by the cluster coccus.*—In the order of time, the first investigation which deserves mention is that of Krause,* who confirmed Rosenbach as to the identity of the cluster-coccus of common suppuration with that of infective inflammation of bone. His excellent experimental results were also of interest, but need not be referred to specially, because they were covered by those made subsequently by others. Next followed the research by Dr. Rodet, of Paris, by which the yellow coccus was introduced to the notice of French pathologists. His point of departure was also osteomyelitis, and his purpose to determine whether or not a disease really analogous to idiopathic or cryptogenic suppuration of the marrow in man could be produced by the introduction of the microphyte into the circulating blood. In this he was so far successful that in that of his experimental animals which survived the immediate effects of the injection, suppurative foci presented themselves in the long bones, particularly the femur and tibia, which in their localisation and character resembled those of idiopathic osteomyelitis in man.† M. Rodet's results as to the production of

* Krause: Die Mikrokokken der Osteomyelitis. Fortschritte der Medicin, 1884, ii., p. 221—261.

† Dr. A. J. Rodet: De la Nature de l'Ostéomyélite Infectieuse: Production d'Ostéites Epiphysaires par l'Injection des Liquides des Cultures sans Traumatisme Osseux. Revue de Chirurgie, 1885, pp. 973 and 636.

osteomyelitis by the intravenous injection of the yellow cluster coccus and the resemblance of the disease so produced to infective myelitis in man, have been confirmed by later observers, particularly by MM. Dannelongue and Archard.* The pathologists find that although, when osteomyelitis is produced by the infusion into the circulation of cultures of staphylococcus, it may begin superficially—*i.e.*, under the periosteum,—it usually begins in the medulla or spongy tissue, a favourite seat of origin in animals not fully grown being the lower end of the femur at the junction of the diaphysis with the epiphysis ; so that when, as in some of Rodet's experiments, the most obvious lesions are arthritic, the joint affection is found to be dependent on disease of subjacent bone. Thus the cluster-coccus might reasonably enough be called the myelitis-coccus, were it not that occasionally it kills by infecting the kidneys and other viscera without harbouring in the bone marrow. Among the earlier experimental investigations which were made during the years which immediately followed the publication of Rosenbach's work, few were more satisfactorily carried out than that of Dr. Lübbert of Würzburg,* as regards the care bestowed on the clinical, bacteriological, and anatomical parts of the inquiry. Pure cultivations of staphylococcus were for the most part derived from osteomyelitis, for the idea of its specific relation to that disease still had its weight. Sterilized salt solution in which pure colonies of staphylococcus were suspended so as to form an opalescent liquid were introduced either into a serous cavity or into a vein. If the peritoneum was the channel employed, the injection killed the animal in a few hours ; or if it survived the immediate effect of the injection, gave rise to secondary inflammations of internal organs, both of these effects being of course due to the entrance of the microphytes into the circulation through the lymphatics. The nature of the infective lesions and the fate of the organism in the circulation could be better studied after injection of the diluted culture into the venous system. Lübbert found that whereas shortly after the injection the microphytes can be readily detected in the blood, they are not

* Lannelongue et Archard Etude Experimentale des Ostéomyélites à Staphylocoques et à Streptocoques. Ann. de l'Institut Pasteur, vol. v., p. 209. 1891.

many hours in disappearing entirely, and are then found in numbers in the urine. Still later they are neither forthcoming in the blood nor urine, and Lübbert concluded that most of them had been eliminated by the kidneys from the body. Of the small minority that remain are, however, quite sufficient to do mischief. In the kidney, which in cases of infective endocarditis and osteomyelitis in man we have seen to be the favourite seat of secondary foci, the appearances are as follows :—On stripping the capsule, yellowish patches, more or less prominent, are seen on the external surface of the organ, while in section the cortex shows nodules of various sizes, most of them milinary. Of these grey spots some are obviously abscesses, but the most minute are glomeruli, of which the afferent arteries and capillaries are choked with micrococci, these organisms also occupying the space between the tuft and the capsule. Here and there spots of necrotic tissue are met with, surrounded by a zone of purulent infiltration, and it is then seen that the micrococci occur both incorporated in the pus-corpuscles and in the intercellular liquid. In the medullary part of the linear streaks are chiefly due to plugging of the uriniferous tubes with cocci. Sometimes a vein is beset with cocci which penetrates into its wall. In the heart there are opaque modules as large as pin heads, some of which are superficial—that is, subjacent to the serous membrane or endocardium ; others disseminated in the muscular substance. Each is surrounded by a zone of hyperæmia, beyond which the muscular fibre exhibits signs of degenerative change. These minute abscesses are for the most part in relation with emboli in capillary arterioles. As regards the medulla of bone, Dr. Lübbert added nothing to the observations of Rodet as to the development of osteomyelitis, and was indeed unable to confirm them. But that question has, as I have already stated been completely settled since by Lannelongue. The sketch that I have given will at least serve to indicate the two directions in which it was necessary to investigate the pathogenic action of our microphyte. Its local action shows itself wherever it is introduced into the body, human or animal—in the peritoneum, in the cornea, in the subcutaneous tissue. Its general action shows itself in the internal organs, to which it finds access exclusively by the blood stream.

I will first ask your attention to the changes which result from the local action of the cluster-coccus as observed in the cornea and subcutaneous tissue ; in respect of which I will refer to a series of very valuable researches lately carried out in the Pathological Institute at Bonn, under the direction of Prof. Ribbert ; to the important paper of Dr. Hess which emanates from another centre of pathological work, Prof. v. Recklinghausen's Laboratory at Strasburg, recently published in Virchow's *Archiv* ; and to an equally important investigation by Dr. Hohnfeldt contained in the third volume of Ziegler's *Beiträge*.

To be concluded.

Reports of Societies.

STUDENTS' SOCIETY, VICTORIA DENTAL HOSPITAL, MANCHESTER.

THE Inaugural Meeting of the above Society was held on Tuesday, October 20th. The whole of the Hospital was thrown open on that evening; the waiting and extraction rooms made a commodious concert hall by throwing open the folding doors, the other parts of the Hospital were utilised as reception, cloak, smoke, and refreshment rooms, the whole being tastefully decorated with hangings and plants. The proceedings opened with a reception by the President, Mr. W. Simms.

Besides members of the Society, a great many guests and visitors were present, the whole numbering over sixty. Amongst the guests were Professor Young, of Owen's College ; Mr. Coppinger, of the Layboard ; Parsons Shaw, Esq.; Rev. Ellison ; Rev. McGovern ; and Mr. Kirlew, of the Strangeways Refuge.

At 8 o'clock, Mr. George Kershaw opened the programme by an able musical introduction on the piano.

The following gentlemen were proposed as members of the Society :—Messrs. Dreschfeld, Leeming, Lees, Mawson, Sibson, Stevenson, and Theakston.

Mr. W. Simms then delivered his Presidential address. (See page 1020).

Mr. G. G. Campion proposed a vote of thanks to Mr. Simms for his address, which was seconded by Parsons Shaw, Esq., and carried with acclamation.

Mr. H. Minshall then favoured the company with a capital humorous recitation, entitled "Waiting for the Dentist." This was followed by a most interesting lantern display by Mr G. G. Campion, which comprised lantern slides and microphotographs relating to the various causes and phases of dental caries.

During the evening a very good musical entertainment, consisting of handbell ringing, glees, solos on xylophone, flute, fairy bells, &c., was provided by the choir from the Strangeways Refuge. A number of microscopes were on view during the evening, the society being indebted to Mr. Campion, Mr. Dunkerley, Mr. Hooton, and other members, for the loan of instruments and valuable slides. Mr. Dunkerley also exhibited a number of exceedingly interesting specimens of comparative dental anatomy. An exhibition of electrical appliances by Messrs. Hirst and H. Dreschfeld was also on view, many ingenious appliances both for general and dental purposes being shown.

The proceedings terminated by Mr. H. Planck proposing a vote of thanks to Mr. G. G. Campion for his lantern display, to Mr. Hirst for his electrical exhibits, to the Strangeways Refuge Choir for their entertainment, and to Mr. H. Minshall for his recitation, which was seconded by Mr. J. C. Stokoe, and supported by Mr D. Headridge. Mr. Kirlew having briefly responded on behalf of the choir, the rest of the evening was spent in examining the various exhibits, &c.

Dental News.

DR. PARSONS SHAW.

THE Manchester dentists have shown their appreciation of the eminent position this gentleman has attained in the profession, and of his labours on its behalf, upon his retiring from practice and returning to his native country, in a manner that has reflected as much honour upon themselves as upon him.

It is thirty-five years since he commenced practice in Manchester, where he soon acquired a position as a gentleman and a dentist, and began to demonstrate the great results that can be obtained by conservative dentistry, by operations that are the admiration of the skilled dentists of to-day. When the Victoria Dental Hospital was formed, he was one of its most active promoters, and was appointed one of the consulting dentists, and the first Dean of the Dental School. As the inventor of the dental engine bearing his name, he has become widely known as a practical mechanician. One of the secrets of his success has been that he has always believed in the profession he practised, and that it required a rare combination of high mechanical skill and varied and extensive learning. For that reason he has upheld it as an independent profession, and has strongly opposed every attempt to make it merely an inferior branch of another profession, maintaining that those who would do so, could not have realized what dentistry really was. Believing in dentistry as a great profession that could only be carried to its perfection by the cultured gentleman, he has also strongly repudiated the Trades Union proclivities of a certain set. And at all times has maintained that the only way to elevate a profession was for each and every member of it to do his best to elevate himself; a maxim that has already become a watchword. To that end he was the originator of the Manchester Odontological Society, that has already done so much good, and now leads the way to true reform. He is also a strong advocate of the higher dental degree so ably championed by Mr. George G. Campion.

He was, in his earlier years, a frequent writer in various branches of literature; although of late years his contributions have been chiefly to the American Dental Journals. But his letter on "The Origin and Ultimate End of the American Tariff," were written only about eight years since, and at once made a strong impression, as he was the first to point out the natural results of the stimulus to manufacturing in the United States given by the tariff, and gave the key note to "tariff reform," that is now seen to be inevitable, and has become the settled policy of one of the great political parties. He seldom expressed an opinion that was not well matured, but then held to it with great tenacity. He is a strong fighter, but hits fair, and never shows any temper except to repel a meanness, or expose dishonesty, then he is

disposed to be severe. It is evident that he takes into his retirement the kindest regard of all, and especially of those who have been most intimately connected with him in his public and private capacity.

APPOINTMENT.

Mr. George Thomson has been appointed Dental Surgeon to the Western Hospital for Consumption, Torquay.

Dental Hospital Reports.

STATEMENT OF OPERATIONS performed at the Birmingham Dental Hospital, for three months ending September, 1891.

	July	Aug.	Sep.
Extractions under Anæsthetics	407	532	464
„ Without Anæsthetics	434	438	416
Gold Fillings	32	37	54
Amalgam Fillings	101	67	93
Osteo Fillings	72	90	105
Permanent Gutta Percha Fillings	17	26	16
Temporary Gutta Percha Fillings	30	36	49
Dressings (nerve canals treated &c.	145	143	172
Scalings	16	17	17
Crowns, regulations and attendances on ditto	55	35	60
Advice	203	223	196
Total number of Operations	1512	1644	1642
„ „ Patients attending	809	793	854

J. ERNEST PARROTT,

House Surgeon.

British Journal of Dental Science.

No. 573. LONDON, DEC. 1, 1891. VOL. XXXIV.

ANÆSTHETICS.*

By Mr. ALEXANDER WILSON, F.R.C.S.

Senior Administrator of Anæsthetic, Royal Infirmary,
Manchester. Administrator Anæsthetics, Victoria Dental
Hospital.

Mr. President and Gentlemen,—The subject of Anæsthetics is not a large one, and for some forty years the field has been covered with very able workers. It follows, that the difficulty of saying something new upon the subject, is great. I shall not attempt much, but confine myself to-night to a brief review of the various anæsthetic agents in common use, with a view to their respective advantages and disadvantages.

For the due production, localization and appreciation of a painful sensation it is necessary, that certain nerve organs should be in a condition of functional activity. These consist of the sensory end organs and terminal fibres of the nerve, which receive the impression, the nerve trunks and the spinal cord which transmit the impression, and the higher centres in the brain which receive and appreciate the stimulus.

To prevent the appreciation of an otherwise painful injury, it is necessary to interfere with one or all of these three factors. Anæsthetics cause anæsthesia by exerting a paralysing influence upon one or all of the links in this nerve chain. They are divided into local or general anæsthetics, according as

* A paper read before the Manchester Odontological Society.

they paralyse the terminal nerve fibres alone, or the higher centres or both.

Local Anæsthetics act by paralysing the terminal nerve fibres in the region to which they are applied. They may be divided into two classes, agents which act mechanically, by reducing the temperature of the part to such an extent, that the vitality of the nerves is so lowered that their functions are in abeyance and certain drugs which have a specific paralysing influence upon the terminal nerve fibres. Cold, whether produced by ice and salt mixture, ether spray, or any other volatile substance as an anæsthetic, has certain disadvantages, in all cases. The principle of its action is bad, that is, the lowering of the vitality of a part until its functions are in abeyance. This interference with the nutrition, slight though it is, may be attended with trouble afterwards, such as delayed healing, sloughing, or inflammation. The freezing of the region is also painful, and the thawing afterwards is still more so.

In general surgery, cold as an anæsthetic is used only for the removal of ingrowing toe-nails, and not often for that.

In dentistry, for two reasons its application is difficult: substances used for its production, such as ether spray are not well tolerated in the mouth, and it is difficult to confine their action to one tooth. Judging from the effect of cold applied to a large gold filling, it must be rather uncomfortable to adjoining teeth when they happen to be filled.

Of drugs which exert a specific effect upon the nerve fibres, the chief is cocaine. This alkaloid, first separated in 1860,—though its local anæsthetic properties were then known,—did not receive any degree of attention until 24 years later. Since then, numerous experiments have been made with it, and it has enjoyed a large amount of popularity with the profession and the public.

It appears to cause anæsthesia by exercising a specific

paralysing influence upon the terminal fibres of the sensory nerves, the motor nerves are unaffected except by very large doses, the anæsthesia only extends as far as the drug traverses the tissues. It has therefore to be brought into intimate contact with the nerve fibres before sensory paralysis is induced. This is easily managed in the case of mucous surfaces, where the mere painting or spraying on the dried mucous membrane is enough to cause loss of sensation. For the eye, a few drops of 4 per cent. solution of the hydrochlorate of cocaine, with a little self-control on the part of the patient, is enough to permit of the performance of many ophthalmic operations. Such as the extraction of cataract, the removal of foreign bodies in the cornea, etc. Still, even in eye surgery, general anæsthetics are yet largely used, as cocaine with the greatest self control by the patient, does not give that perfect steadiness desired by the operator.

For cutting operations on other than mucous tissues, external application is no use, the drug must be introduced by multiple hypodermic injections into the area of operation, and here begin our troubles.

The prick of the needle, especially when repeated is annoying to the patient, and rather resented ; what is more, when it is inflicted upon an inflamed part, such as a whitlow, a boil, or an inflamed alveolus, the pain is intense. Apart from the mere prick, the increase of tension in the inflamed area which follows the introduction of the solution, greatly aggravates the existing pain.

Further, cocaine does not act well in an inflamed area. Probably for two reasons ; the excess of fluid in the part (the increased tension) makes it difficult to inject the solution ; the solution when injected becomes too freely diluted by the inflammatory exudation to have much effect.

But there is a greater disadvantage than the pain, the in-

jected cocaine is absorbed into the system, like any other drug given hypodermically, and begins to exercise an effect upon the system at large. Once under the skin, it ceases to be local in its action, its anæsthetic effect is local ; but its physiological action is exerted upon all the organs of the body, as much as any other drug which is absorbed into the blood.

Cocaine is thus by no means local in its effects, any more than is morphia when given hypodermically, it is local in its anæsthetic effects, that is all. In using cocaine, it cannot be administered without producing some influence upon the general system, that may be very trivial or very great, but it is no doubt always present. Its physiological action, when introduced into the blood is, exerted chiefly upon the nerve centres, in this it resembles the general anæsthetics.

On the heart it has a marked depressing influence—it causes a lowering of the blood pressure—diminished respiratory movements and in large doses respiratory paralysis.

In the human subject these are exhibited by such symptoms as pallor of the face, feelings of giddiness and faintness, sensations of uneasiness and depression over the heart, palpitation and feebleness of pulse, coldness of the skin and perspiration.

There is great mental depression, sometimes talkativeness. Numerous cases, showing all and more than these symptoms are reported in the various Dental and Medical Journals. It is not necessary for me to quote any of them.

I shall just remind you of the results obtained by Dr. Geo. Cunningham published in the Transactions of the Odontological Society in 1887. In a series of 27 cases of the administration of cocaine, general symptoms followed in about 21, these varied from slight, to alarming attacks of faintness.

It is to be noted that, in all these cases, there was no marked relation between the dose and the symptoms, general

symptoms were caused by $\frac{1}{2}$ a grain and a grain, while, sometimes none were caused by $1\frac{1}{2}$ gr.

To induce satisfactory anæsthesia by cocaine for the extraction of a tooth it is necessary to inject at least from $\frac{1}{2}$ to 1 grain of the drug; when this is done, it is always at the risk of producing more or less dangerous general symptoms.

In the light of these facts I venture to submit to you the conclusion, that as an anæsthetic, for the painless extraction of teeth cocaine is not as efficient or as safe as nitrous oxide.

GENERAL ANÆSTHETICS.

In general anæsthetics, we have agents which, from their gaseous or volatile character, possesses special facilities for being readily introduced into the blood, through the lungs, and which, circulating in the blood, exert an influence of a paralysing nature upon all the nerve organs. This paralysis is most marked in the case of the higher centres, that is, those centres which are latest developed.

The general anæsthetics, while they exercise a benumbing or paralysing effect, upon the terminal sensory nerve fibres, and also upon the conducting paths to the brain, owe their power as anæsthetics almost entirely to their capacity of paralysing the higher perceptive centres in the brain.

The action of these drugs upon the system aptly illustrates the "Law of Dissolution." The several organs of the nervous system are paralysed in the inverse order of their development, the highest and latest developed organs, the ones least essential to life, are the first to be paralysed, and as the gradual continuous absorption of the anæsthetic proceeds, the fundamental centres, those necessary for the maintainance of life, are the last to succumb.

It is probably impossible to get an anæsthetic which will paralyse only the accessory part of the nervous system, leaving

intact the fundamental portion, we have therefore to choose the agent, with which there is least chance of paralysing the circulation or respiration.

In placing the body under the influence of an anæsthetic, besides the danger of the paralysis of the vital functions, there are other elements of risk to be taken into account.

The whole nervous system is an elaborate and complex mechanism, between the different parts of which, there is a constant passage of nerve force, a constant action and reaction taking place, in response to stimuli in different parts of the body. No change can occur in any part of the system, without it having some indirect influence on some more distant part or internal organ.

When under the influence of an anæsthetic, these mechanisms are under abnormal conditions, their relation to one another is more or less altered. Impulses travel along the nerves less readily, or in certain stages of anæsthesia more rapidly than usual,—some nerve centres, released from their normal control are free to act more independently, impulses reaching reflex centres, instead of being confined and reflected from those centres spread to, and influence other centres and so on, some centres are paralysed while others remain active.

As an example of the altered behaviour of the nervous system to external stimuli when it is under the influence of drugs, I may remind you of the effect of strychnine.

In an animal poisoned by strychnine, a slight stimulus, which would normally cause but a single reflex movement, will produce general convulsions of the whole body.

In the anæsthetic state we have a somewhat similar instance in the exaggerated effect of pain when the patient is only partially under the anæsthetic.

The fatal cases with nitrous oxide have probably been due to this as also certain deaths from chloroform. I am of course

aware that the Hyderabad Chloroform Commission in their experiments failed to produce this in animals,—it, however, appears to occur in man.

I have no doubt, that the hysteria which follows the exhibition of anæsthetics, especially N_2O , is largely provoked by the shock, exaggerated by the semi-anæsthetic condition. In the same manner, that when there is no anæsthetic in the case, a mental shock or an injury, produces most marked hysteria, not merely an hysterical outburst; but grave functional or hysterical paralysis.

This, however, is not our subject for to-night. I only wish you to remember, that in giving an anæsthetic you alter the normal relations of the various nerve centres to one another, and this must be taken into account in explaining the phenomena which sometimes occur. Nitrous oxide naturally comes first in a paper of this kind, as an old familiar friend, it is not necessary to say anything in its favour. It is admitted to be the pleasantest, most quickly acting, and safest anæsthetic.

It is capable of very wide, safe application; though there are many diseased states of body in which its administration requires great care, there are few, if any conditions, in which its use is contra-indicated. It can be given at almost any age, to pregnant women, and in extreme lung disease, while heart disease, that bugbear of the chloroformist is no bar to its use, (of course with care.)

The cases in which death has happened during its use (I don't say from its use) are very few, about 1 in 100,000 administrations.

To its employment in general surgery, there are some objections, to my mind the shortness of its action is not the chief of these. In operations where the administrator can have free access to the face, the anæsthetic effect of gas is short, only because the administration is short. There is no reason

why it should not be made longer, by continually re-administering it. I have several times successfully kept a patient insensible for from 5 to 15 minutes and discontinued the gas, only because the operation was completed. Many cases are reported where unconsciousness has been kept up for half-an-hour, and one case for as long as one hour forty minutes.

The real disadvantages are more from the cyanotic appearance and stertor of the patient, and especially the unsteadiness, discomposing the surgeon.

In addition it is difficult to keep the patient just under and yet steady, and to avoid the muscular twitchings.

In spite of this, there ought to be more use for nitrous oxide in general surgery than there is. In short operations in the out-patient room or consulting room, it would be very useful, especially in cases where the patient wishes to go home at once.

In dental operations, where continuous administration of the gas offers exceptional difficulties, and where its re-application after one extraction is inadmissible from blood in the mouth its use is limited to short operations.

In treating of N_2O as an anæsthetic for dental operations, we have to ask ourselves in what class of cases may its exhibition be attended with difficulty or be unsatisfactory. It is safe in all cases, but that is not all required of it, it is not enough that the patient should leave the operating chair alive. He or she must leave it with the operation completed and leave it quietly too, without having made any disturbance and go away feeling that they have had a pleasant experience which they would willingly have repeated. Now in certain cases, N_2O will not accomplish all this. What are the cases?

Anæmic persons form a class of cases, which as a rule are

troublesome with gas alone, it is not hurtful to them, the trouble comes about indirectly in this fashion.

The prominent feature of anæmia is a diminution in the number of red blood corpuscles, there is a consequent decrease in the oxygen carrying capacity of the blood. This is indicated by the breathlessness from which subjects of this malady suffer—they bear deprivation of oxygen less well than healthy persons. It follows, that when gas is given, and all the oxygen from the air is cut off, the oxygen in the body is soon exhausted, before enough gas has been absorbed to have any lengthy anæsthetic effect. So in these cases, the patient is soon under, that is, soon exhibits asphyxial symptoms, and quickly returns to consciousness. I sometimes think that there is also more spasm of the muscles and unsteadiness than there is normally. There are other troubles, anæmia means a tendency to fainting, whether from fear, lowered blood pressure, such as obtains with gas or pain. The nervous system shares in the defective nutrition of the general system. This lack of tone in the nerve centres, manifests itself in a liability to hysteria on slight provocation. In patients of this description, it is needful to be very careful not to let them feel any pain, as the impression it makes on them is always greatly exaggerated and may have far reaching consequences in the way of hysteria, and so on.

When several extractions are needed in an anæmic subject, by far the best plan is to give some anæsthetic which will allow ample time for the complete operation to be done at once, and performed painlessly.

Of course as an alternative, with gas only, the work may be spread over several operations, but this has a bad effect on the patient, and is probably more dangerous than the single exhibition of ether for one operation.

Plethoric people are also not amongst the most manageable cases with gas. In them, this is the condition, there is too

much blood, and too much tissue, so that there is an immense demand on the blood for oxygen by the tissues a demand greater than can be supplied through the lungs. As a consequence there is shortness of breath, deficient oxidation, and a marked venous appearance of the surface bloodvessels.

There is defective oxidation as in anæmia but from a different cause. Such cases suffer from the deprivation of oxygen—when gas is given they early show marked signs of asphyxia, and are inclined to get unsteady from muscular twitching, they also consume a large quantity of gas.

In these cases I would suggest an additional anæsthetic. Ordinary well-developed, muscular, young men often become very rigid and unmanageable when fully under the influence of gas. The cause of this I am not prepared to explain.

Children take gas very well, but in their case, the rigidity produced by it and the shortness of its effects, makes it an unsuitable unæsthetic for them when several teeth have to be extracted. Rather than risk hurting them and destroying their confidence, it is better to give a more powerful anæsthetic.

Practically, all the disadvantages of nitrous oxide as an anæsthetic, depend upon the short period of complete anæsthesia produced by it, combined with the fact that the semi-conscious state is a condition of general hyperæsthesia, in which pain, in common with other external sensory stimuli creates an exaggerated impression upon the nervous system.

Therefore, all persons, who, from any temporary or permanent condition are extra susceptible to shock, are not good subjects for operation under gas alone; unless it is quite certain, that the operation can be easily completed before the return of consciousness. The risk is, that they may feel the operation, suffer from shock, or symptoms caused by shock, and lose their faith in the gas and in their dentist.

My one fear in giving gas, is, that the patient should feel the pain, and be in a position to reproach me afterwards.

One word upon heart disease in relation to gas. The dangers, such as they are, are indirect ones—there is the risk of causing excessive engorgement of the right side of the heart by Pushing the administration too far, and there is the risk of the shock from the extraction when too little is given—syncope being naturally more likely to happen in a diseased heart and to be proportionately more serious. The plan is, not to attempt any extensive extraction operation with gas alone, and to give some ether along with the gas, if there is any chance that the operation may be difficult.

The usual alternatives to N_2O are the anæsthetics Ether, Chloroform, or Meth. Bich. These differ from N_2O in one important particular, they all have an appreciable death rate. As they all produce anæsthesia sufficient for any operations of whatever magnitude, in selecting one, we must be guided solely by considerations of its safety.

Which is the one, the giving of which is attended with the least risk? For the answering of this question, an enormous number of experiments have been made, and hundreds of different kinds of animals have been sacrificed to elucidate the point, but without avail it is not quite agreed upon even now.

(To be concluded.)

AMALGAM DIES FOR INLAY WORK.—The copper amalgam dies are most useful in such a class of cases as you have seen represented, where you have a good chance to get an accurate impression of the cavity. The amalgam is filled directly into the impression. The surface of amalgam, if thoroughly and properly set, is satisfactory to burnish to. I find it gives an inlay that will fit accurately if carried out carefully. This is applicable to making solid inlays or a sort of shell inlay.—
Dr. AMES. *Ohio Journal.*

NEURALGIA.*

By WILLIAM RUSHTON, I.D.S., Eng., Assistant Dental Surgeon, National Dental Hospital.

Mr. President and Gentlemen,—Having been requested by our President to read a paper to-night, I consented to do so, on the subject of Neuralgia, uttering a mild protest at the same time at the short period allotted to me for the work. This explanation will, I hope, be sufficient to claim your indulgence for any shortcomings in the treatment of a subject which must be of great interest and importance to all of us.

First of all, let us enquire "What is neuralgia"? Its etymology would tell us that it means "nerve pain," but as every pain and ache in the body is a "nerve pain," the literal definition is much too general. Mr. Bowlby gives a short definition of neuralgia, as "a local pain, without local signs of inflammation or disease." Dr. Buzzard says that it is "a term applied to a disease of the nervous sensory apparatus, marked by paroxysmal pain, which is for the most part unilateral, and in the course of nerves." He says that it may be accompanied by inflammation of the nerve sheath or there may be no discoverable change in the periphery of the nerve, and it is to this latter kind of cases, that the term neuralgia is most properly applied.

The causes of neuralgia are predisposing and exciting. Predisposing causes, include hereditary tendency to nervous affections, such as epilepsy, lunacy, chorea &c., other causes are malaria, anæmia and mal-nutrition. The exciting causes are chiefly, (a) exposure to cold, (b) pressure or irritation of nerve trunks by violence, morbid growths, &c. (c) Peripheral irritation may excite neuralgia in nerves nearly, or remotely associated, for example, dental caries may excite supra-orbital neuralgia. (d) Irritation or disease of the central nervous system. The varieties of neuralgia are divided into two main groups, namely superficial and visceral, which names explain themselves, the former including tic doloieux, cervical, dorsal, intercostal, lumbar neuralgias, &c., and the latter neuralgia of the heart, stomach, bladder and other viscera.

We shall only concern ourselves to-night about that superficial neuralgia which occurs about the head, face and neck,

*A paper read before the Students' Society National Dental Hospital, London.

and of which under the names of *tic doloieux*, trigeminal neuralgia or cervico-occipital neuralgia we see so much in our work day by day.

The symptoms of neuralgia are briefly and essentially "pain," which is localised more or less accurately to the area supplied by a certain nerve or nerves. The pain may be of a darting, shooting, plunging, or boring character. In neuralgia about the head, the patient is often seen to cringe and recede before the plunges of pain, as though he were receiving blows. Pressure on the spot where the affected nerve emerges from beneath the deep fascia, or from a bony canal, intensifies the pain.

Now, although toothache or odontalgia often occurs together with neuralgia, and we have difficulty in distinguishing one from the other, yet when the pain is distinctly referred to a tooth, we call it odontalgia, and when the tooth is free from pain, or the suffering in other parts is so great as to distract attention from it, we call it neuralgia.

Here our short definition will help us, "local pain without local signs of inflammation or disease." Hence, if we see a patient who complains of pain originating in a certain tooth and calls it neuralgia (as many of them do) and we find an exposed pulp or an incipient abscess, we find local pain *with* local signs of inflammation, and therefore, we will know that it is not neuralgia. But if on the other hand a patient does not refer the pain to an exposed pulp or an abscess which is present, but to another part, then we say that is neuralgia because it fulfils the conditions of our definition.

"By far the most common cause of dental neuralgia is chronic inflammation of the pulp, and with regard to exposure of the pulp it may be remarked that violent toothache and well marked neuralgia do not commonly co-exist; the local pain and the diffused pains seeming to stand in a measure in a complementary relation to one another. Local inflammations by no means always give rise to local toothache, even though they be capable of causing excessive neuralgia. So long as the exposed nerve escapes acute inflammatory attacks, no pain may be felt in the tooth." *

We must, however, remember that although the essential element of neuralgia is pain, that the pain is not the disease, but only the symptom of the disease. As Trousseau says. "Whether the neuralgia be due to chlorosis or to a carious

* Dental Surgery. Tomes.

tooth it is still a symptom ; in the first case of chlorotic cachexia, in the second of dental caries," one form of neuralgia here is caused by constitutional disease, viz. chlorosis, the other by local disease, viz. dental caries, their cause and their treatment are different, but their essential symptom is the same, viz. pain.

As we are now especially studying neuralgia of the head and face, let us refresh our memories briefly concerning the fifth nerve and its connections. The fifth or trifacial nerve, the largest of the cranial nerves consists of a motor and sensory portion, the sensory fibres passing through the Gasserian ganglion and being distributed to the face and a portion of the head. The motor portion, much the smaller, is physiologically independent of the ganglion and supplies the pterygoid, masseter, buccinator and temporal muscles. The two first divisions, the ophthalmic and superior maxillary are entirely sensory, and proceed from the ganglion ; the third or inferior maxillary division proceeds also from the ganglion, but receives besides the whole of the motor root.

As regards the connections of the fifth nerve, Quain says that "all the cutaneous offsets of the fifth nerve form communications with the adjacent ramifications of the seventh or facial nerve." The fifth nerve also communicates with the auditory and the glosso-pharyngeal, it has communications with the third, fourth, and sixth nerves by its ophthalmic branch, with the tympanic plexus through the otic ganglion, to the nose through the branches of Meckel's ganglion and the naso palatine.

It is also connected with the great auricular and small and great occipital nerves by the posterior auricular of the facial by their cutaneous branches. It is also connected with the sympathetic and pneumogastric. This close relationship should always be borne in mind.

Thus we see that the fifth nerve has large communications between its own branches and those of other nerves, and according to Tones it is where a number of nerves inosculate (such as for instance a spot near the parietal eminence known as the parietal focus) that the most common cases of neuralgia occur. Other favourite foci are "at the supra orbital notch ; within the eye ; and at the inner angle of the orbit ;" those belong to the ophthalmic division, the one least often affected in dental neuralgia. The usual foci in the second division are, "the infra orbital, where the nerve emerges from its bony canal,

the malar, the palatine, and the whole alveolar border. In the inferior maxillary we have the temporal, a little in front of the ear and the inferior dental. The labial and lingual are rarely seats of pain. These foci are the spots where neuralgic pains are most likely to occur.

The question may naturally be asked why if the cause of pain is in one part, the pain itself is referred to another part? One reason is, that when a nerve trunk is injured, the injury is felt at the periphery of the nerve; thus, if the ulnar nerve is stimulated, tingling is felt in the fourth and half the third fingers; if the inferior dental nerve is interfered with, by say a developing lower wisdom tooth, the pain may be felt in the bicuspid region, that is to say, at the mental foramen where the nerve emerges.

But sometimes the pain is referred to quite a remote part, such as supra-orbital neuralgia from a carious wisdom tooth. How is this accounted for?

Dr. Maughan in an interesting and instructive paper on "Referred Neuralgia,"* comes to the conclusion that neuralgic pain is referred to a spot more or less remote from the real cause of pain (such as pain in the temporal focus a little in front of the ear caused by a carious lower molar), by three main causes.

1st. By irradiation.

2nd. By the arrival of the nerve current at a remote sensory nerve centre in the cortex of the brain.

3rd. By the misinterpretation of a message correctly represented at the sensorium. (This case Dr. Maughan considers rare).

First by irradiation. Dr. Maughan quotes Dr. Ross in support of this theory, that the nerve current overcomes the resistance of its insulators and irradiates or escapes down a side branch. This will only explain some neighbouring neuralgias.†

Secondly. The nerve current may be supposed to go to a nerve centre that it has no business to meddle with, and which has had occasion to transmit many former messages, and this dutifully sends its own message, which, of course, does not correspond to the spot from which the original message was sent to the brain. For example :—A person at some time pre-

* "Referred Neuralgias" Journal of the British Dental Association, Dec. 1887. Dr. James Maughan.

† "Disease of the Nervous System" James Ross. M.D., 1883.

vicious has had much pain in, say, the temporal focus, from a decayed molar. He happens to get severe indigestion and gastralgia, and the impulse is conducted by the pneumogastric to the brain accordingly. Knowing as we do, the close connection which the pneumogastric and the fifth have in their origin, it is not very difficult to suppose that the nerve current might get switched on to this fifth nerve which has been so well used before, and the patient gets the same pain as he had from the tooth, when it really arises from the stomach.

Thirdly, The message has been sent and received correctly by the brain, but through some fault of the apparatus the mind is misinformed as to the seat of pain. For example, as in hypnotism the mind of the subject can be most easily and thoroughly misinformed as to pain by a mere suggestion of headache, toothache, burns, &c.

Before bringing my subject to a close I shall briefly recount one or two cases in point.

The case of Dr. Lauder Brunton, shows how headache and carious teeth are closely connected. Dr. Brunton's attention was attracted to the relation of headache and carious teeth by his discovery of its occurrence in his own person. He found a carious wisdom tooth on the same side as the headache and accounting for it. "Not unfrequently," he says, "when I have pointed to a decayed molar as the origin of the headache the patient has said, 'but I have no pain in the tooth,' and to this I usually answer, it is quite natural, you get the toothache in another part of your head. Dr. Brunton's experience tells him that a decayed molar in the lower jaw usually causes a temporal or occipital headache and a decayed molar in the upper jaw causes temporal headache rather further forward than that caused by the lower jaw. Caries of the incisors or eye teeth is more likely to cause frontal or vertical headache."

Dr. Brunton has noticed as the special seats of headache connected with teeth, the temporal and occipital regions; this location he attributes to an affection of the vaso-motor branches of the temporal and occipital arteries through the sympathetic, a spasm or contraction of the vessel causing the pain in the head.*

May this also account for the sensation described so frequently by patients that "their nerves stand out like cords?"

* St. Bartholomew's Hospital Reports. "Disorders of Digestion," Lauder Brunton, M.D., F.R.S., 1886.

Dr. Macnaughton Jones in an able paper on Dental Reflexes,* mentions an interesting case in which general exostosis caused the most acute neuralgic suffering. Before the true cause of the trouble was discovered, Dr. Macnaughton Jones exhausted all the appliances at his command with but temporary relief, until at last it was determined to extract all the patient's upper teeth which had previously been filled. This treatment was adopted with complete success, and the patient has had no return of pain.

The report of Mr. Badcock, the dentist, upon the case is instructive. The extracted teeth were all carious, and all exostosed, the caries and exostosis being distinctly proportionate. At no time were there any localised symptoms. No relief followed any other treatment except extraction. No traces of intrinsic calcification were present. The teeth bore evidence of very hard wear, having large facets.

Mr. Tomes mentions cases in which, on account of even slight exostosis one tooth after another has to be removed until all are gone, after which the patient gains immunity from pain. I myself have had a patient of this nature.

As an instance of neuralgic pain arising from disease of the central nervous system, I will mention a case from memory, communicated by Mr. Newland Pedley to the Odontological Society, of a boy who complained of intense and constant pain in the teeth. The latter were all found normal and incapable of producing the pain attributed to them, so Mr. Newland-Pedley refused to extract them. This the boy did for himself with a pair of scissors, and all the teeth were found to be quite healthy, the dreadful pain having been caused by a tumour in the brain, of which the boy died.

I had a somewhat interesting case three months ago. A gentleman of anything but a neurotic nature, strongly built and accustomed to an out door country life, came to me complaining of a patch of neuralgic pain in the left supra-orbital focus which made his life a misery. The paroxysm came on at any moment when washing his face, blowing his nose or when a draught of cold air played upon him. There was a history of severe rheumatic fever the year before. He attributed the cause of pain to the left upper canine, which was found perfectly sound, though it was slightly loose and had a ring of tartar round the neck. He had had the benefit of

* "Dental Reflexes," H. Macnaughton Jones, M.D., &c., Dental Record, August, 1890.

drugs and electricity, with no effect. I examined the mouth and found a right lower wisdom tooth very carious and somewhat loose, a left upper wisdom stump still more carious and still more loose, and the rest of the teeth sound though somewhat encrusted with tartar. I removed the loose tooth and looser stump, scaled the teeth, scarified the gums, and ordered an astringent mouth-wash. The neuralgia disappeared within three days, and has not reappeared. There was no history of previous toothache. Which of the irritations I removed caused his neuralgia I do not know, I should have liked to have removed them one by one, getting at the cause by a process of exclusion, but my patient had a long way to go, and so I could not gratify my curiosity.

As regards remedies for dental neuralgia, the remedy most to be sought, is the removal of the cause of suffering. It is our duty to place the mouth in a healthy condition, and if this fails let us call in the aid of the physician. Would that the latter called in the skilful dentist oftener than he does, before proceeding to the use of drugs.

Severe cases calling for nerve stretching and excision of Meckel's ganglion &c., do not enter into the scope of this short paper.

I thank you for your patience towards me and hope that the subject has not proved uninteresting to all of us.

TO TRUE CORUNDUM WHEELS.

The following is old, but I think it might be new to some. When wheels have become hollowed or dished on one side, place them, this side down, on a piece of *plate-glass*, then hold the piece of glass over a lamp so the heat will strike the glass under the centre of the wheel. When the wheel has softened so it will settle smoothly to the glass, remove the glass from the heat and put it in a cool place, where the wheel will set quickly. This work must be done very carefully so the wheel will not overheat and run out of shape.—Dr. WM. H. STEELE.

Items.

British Journal of Dental Science.

LONDON, DECEMBER 1st, 1891.

THE QUESTION OF INSURANCE.

It is almost proverbial that of all uncertainties, the life of a professional man is the most so. It is perfectly true that the Dental Surgeon does not meet the same risks from exposure as his medical brother ; he may not be called upon to run the same chance of infectious diseases as the latter, but he certainly is subject to a good many risks, which should, in considering the matter, be tacked on to the usual uncertainties of life. Now a wise man must certainly recognise these facts and take them into consideration. He must remember how personal a thing is his practice ; how little, comparatively speaking, is the value of a death vacancy ; how soon the connection wanders away and the practice becomes valueless. We almost feel that no words of ours are needed to urge these points upon our readers, so obvious do they seem, but it is, alas, not an unknown thing to find they have been forgotten ; and a man taken away, may be suddenly, from the scene of his labours is found to have made no provision at all for those he leaves behind. True it is, that in common with other professions we have a benevolent fund which may come forward and help, but excellent as may be this charity, it seems to us it must always be looked upon as a sort of last resort, only to be taken advantage of when all else has failed. Self-help is the grand motto for the future as for the present. In the present, a wholesome

sense of independence may cause a man to lose some of the plums which those in power distribute to adoring satellites, but in the long run, the independent man will surely find himself on the surer foundation. So with the future. In an ordinary life, it may be sufficient, simply to have put by for the rainy day, but the uncertainties are so many, that the advantage of availing one self of one of the many Insurance offices must be apparent to all. We hold, therefore, that the *Lancet* has done valiant service in putting before the professions some of the many points of doubt and difficulty in connection with the subject. The importance of the matter is so great, that we may be pardoned for directing our readers attention to this supplement. One of the most difficult points connected with the subject appears to be the very serious lack of uniformity not only in the scale as to premiums and surrender value of policies but as to the actual form of agreement adopted by each office, facts which are rather apt to be overlooked by the insuring party. It is surely important, whether residence is confined to comparatively speaking narrow limits or is optional over the whole world. It is surely a consideration whether "the truth of statements" shall be taken to simply mean to be a proviso against wilful falsehood or shall also include such misstatements as none but medical men can help making. Whilst points not unworthy of notice are the surrender value of policies and the amount of grace allowed beyond the date at which the premiums fall due. What has this subject to do with dentistry? Everything. It is the duty of each dentist to shield himself and those dependent on him from becoming beholden to the charity of the Profession, and this he can do by availing himself of the usual forms of insurance.

IN the death of Carl Wedl the author of the "Pathology of the Teeth," and the companion "Atlas" Dentistry loses one of its chief benefactors from a scientific point of view. Professor Wedl was born in Vienna on October 14th, 1815.

where he graduated in medicine. After a short period of private practice at Ischl and Salzburg he made long visits abroad studying in France and England. He then settled in Vienna, teaching pathological anatomy, in 1853 he was made a Professor, and in 1882 Rector of the University. Besides the above mentioned works he was the author of several on general pathology, and of many papers on Dental subjects to Dental Journals. In most of these latter he was associated with Prof. Herder, whom he has survived by twenty-five years.

As must be well known to our readers, each of the States of North America, both in Canada and in the Union have been passing Dental laws which appoint state examiners before whom men, who wish to practice in that particular state, must go whether they possess a diploma or no. This tacit ignoring of the Dental Colleges has given rise to a good deal of friction. It was felt on all hands that there were some colleges whose curriculum and test examinations were quite inadequate, but on the other hand there are many colleges against whom no such charge can be brought. And the grouping of good and bad together has not been productive of harmony. Another objection to the present system is that if a man who has been practising in one State wishes to change his abode and move to another he must again be examined before the board of his new State before he will be allowed to practise. We can scarcely see any injustice in this supposing he moved to an absolutely new country, but as it is only going from one to another of United States it does seem irksome. It is now proposed that a committee of the State Boards shall attend the College examinations and that if they hold these to be satisfactory the diplomas of these Colleges shall be recognized as titles to practise.

A correspondent sends us the following questions, which were asked him at the recent examination. In General

Anatomy, the difference between Arterial and Venous blood, what evidences I could adduce to prove the circulation, the course of the blood from the Right Auricle to the Left Ventricle, the names, and actions of the valves. Then the difference between inspired and expired air, and the effect of Nitrous Oxide Gas on the blood, and generally. I was then shewn a vertical section of the head and neck, and asked to name the various structures pointed out by the examiner. At General Surgery I was asked to name the different kinds of Nasal Polypus, their chief sites, and treatment also, what was Erysipelas, the character of the eruption, cause, and general symptoms. In Dental Anatomy, I was asked the character and formula of the teeth of the Insectivora, a general formula for the Carnivora—the peculiarities of the incisor tooth of the horse, and when the “Mark” disappeared, also what I understood by the terms “Sexual tooth,” and to give examples. In Dental Surgery I was handed several plaster casts of Cleft Palate, and to say whether they were “Congenital” or “acquired,” also what structures I should see above a perforation of the hard palate ; then the various ulcers of the pulp and their treatment, and diagnosis between Polypus of gum and that of the pulp ; and finally what I knew of “Intrinsic calcification” of the Pulp.

FACIAL PARALYSIS.—A young woman with paralysis of the right side of the face was shown by Dr. T. Stacey Wilson, at the Midland Medical Society. The pains occurred simultaneously in the seventh and fifth nerves. The sensory branches of the fifth nerve were affected to an equal extent, and the motor ones scarcely at all. There were no other paralysis ; it seemed the lesion was located in the cerebral meninges. The palate moved perfectly, and the uvula could be completely retracted without the least sign of paralysis. The hearing was impaired on the affected side. Taste was lost.

A Specimen of Elbrosarcoma of the Upper Jaw, removed from a lady, aged 40, was shown by Mr. Barling at the Midland Medical Society. The growth sprang from the periosteum of the right superior maxilla, and had been growing for nearly a year.

TRANSPPOSITION OF VISCERA. —A curious case was shown by Dr. Seymour Taylor, at the Medical Society of London. A boy, aged 13, whose heart's apex beat was on the right side, $2\frac{1}{2}$ inches below and $\frac{1}{2}$ inch internal to the right nipple. No trace of pleurisy was found. The liver was felt on the left side, the spleen displaced on the right. The cœcum occupied the left iliac fossa. The left testis was higher than the right. A similar displacement in a hard-working civil engineer was related by Dr. Heron, who stated that the patient had not felt any inconvenience.

ANOTHER DEATH FROM CHLOROFORM.—A mariner, aged 36, was admitted at the East Sussex Hospital, Ipswich, on November 11th, with a lipoma on the left iliac crest, with great pain. He wished to have it removed. On November 20th, Mr. Wood administered chloroform. He had a good regular pulse. Chloroform was administered by the use of a towel over the mouth and nose, and dropping the chloroform at intervals from a drop bottle. To begin with, the towel was held some distance from the face, but was gradually lowered. He struggled a great deal; the towel was removed at the first sign of relaxation, and from that time he had no more chloroform. The patient was then turned on his right side, and he continued breathing well. When Dr. Brogden was just going to commence the operation, the breathing suddenly ceased. The tongue was

pulled forward with forceps, and artificial respiration was resorted to. Dr. Brogden felt the pulse a short time after respiration had ceased. Artificial respiration was continued for an hour: nitrate of amyl, subcutaneous injections of ether, and the electric battery were all resorted to, without any response. At the *post-mortem* examination all the organs were found healthy. The patient was dreading the operation, having on previous occasions had chloroform, which he stood very badly. Only 2 drachms of chloroform were used, and the patient took less than ten minutes in going under it.

The Annual Dinner of the past and present Students of the National Dental Hospital was held at the Holborn Restaurant on November 20th, Mr. John Langton in the chair, supported by Professor Schäfer, and Messrs. S. J. Hutchinson, H. Weiss, F. Canton, H. Morris, and many others interested in the Hospital. The chairman, after distributing the prizes, in proposing the toast of the evening, "The Dental Hospital and College" commented on the work done, and the success of the students at their examinations. Mr. Weiss, the Dean, in replying, stated that the number of patients treated had risen in a few years from 3,000 to 40,000. He hoped that at no great distance of time, the accommodation of the Hospital will be greatly increased, i.e., as soon as the new Hospital is erected. Several other toasts were proposed, and a very enjoyable evening was spent. We should have liked to have seen the profession give their earnest support, not only personally but also through their friends and patients, to such an excellent institution which is doing so much good for the West, North, and North West districts; but its small accommodation no doubt is the cause of the suffering of so great a number of necessitous people. They should come in one mass to its help, so that a large Hospital might be built, and its funds receive great support

Abstracts of British & Foreign Journals.

SARCOMA OF THE UPPER JAW ; EXCISION ; NO RECURRENCE AFTER FOUR YEARS.

(Under the care of Mr. MORRANT BAKER.)

The great interest in this case lies in the fact that, although the patient has passed the three years' limit, before which no case can be regarded as even comparatively safe from recurrence of malignant disease, no matter how carefully it has been removed, there has been no evidence of return of the growth. It is the more important to place such on record, although we are without any definite idea as to the minute structure of the tumour, because the result of operations for sarcoma of the superior maxilla is so unsatisfactory. "Out of sixty-four cases of which the result is recorded, only four can be regarded (from the three-year limit) as successful, and in one of them the disease reappeared at the end of nine years.* The prospect of surgical treatment is very gloomy." The history of this case resembles somewhat that of one successfully treated by Ohlemann,† a slowly growing tumour of the jaw. For the account of this case we are indebted to Mr. Arnold Lyndon, late house surgeon.

G. H. A.—, aged thirty-six, a marine engineer, was admitted into St. Bartholomew's Hospital on Sept. 19th, 1887. The patient gave the following history : Twelve years ago he had a bad cold in his head, and on rising one morning found that his left nostril was "stopped up," and that he could not breathe freely through it. The obstruction in the left nostril has continued up to the present time ; otherwise the patient has enjoyed perfect health until six months ago, when he noticed that the upper molar teeth of the left side were loose, and seemed to be pushed out of their sockets, so that he could not bite comfortably. About this time also a swelling appeared in the roof of the mouth on the same side. The swelling in the mouth has been rapidly increasing the last few months, and lately the patient has been troubled by tears running down the left cheek.

* The Operative Treatment of Malignant Disease.

† Ibid., Butlin, p. 133.

Present condition—Patient is a healthy looking and powerfully built man. The left cheek is obviously fuller than the right, and the left half of the nose is broadened and bulged outwards, and tears are constantly trickling down the cheek. The left eyeball is not pushed upwards or forwards, and its movements are free and natural, but the patient complains of slight dimness of vision on that side. On closer examination, a hard, rounded swelling can be felt in the left cheek below the orbit, and on examination with a speculum a fleshy-looking growth is found to occlude the passage of the left nostril. There are no enlarged glands in the sub-maxillary region. Inside the mouth an oval swelling is seen projecting from the hard palate on the left side. The swelling is elastic, red, and velvety in appearance, and everywhere covered by the mucous membrane of the mouth. It begins in front opposite the first bicuspid tooth and extends backwards to the soft palate, while laterally it is bounded externally by the alveolus of the jaw, and internally it reaches nearly to the middle line of the palate. The upper molar teeth on the same side are very loose and pushed downwards, so that the greater part of the fangs are exposed.

No doubt being entertained of the nature of the growth, Mr. Baker advised the patient to submit to operation, but as the growth did not appear to involve the orbit Mr. Baker determined to a partial excision of the upper jaw, leaving the floor of the orbit intact. On Sept. 21st, the patient being under the influence of chloroform, a gag was inserted in the mouth, and Mr. Baker punctured the swelling in the roof of the mouth with a narrow-bladed knife. The knife passed through the growth right up into the antrum, and the puncture bled freely. The gag was then removed, and the operation for partial excision of the upper jaw by the external flap method was carried out in the usual way. The bone was found to be very soft and friable, and crumbled away when seized with the lion forceps. Much of the growth came away with the bone, and what remained was cut away piecemeal with scissors. The whole of the antrum and nostril were found to be filled with a very soft and vascular growth, presenting all the characteristics of a rapidly growing sarcoma, but the floor of the orbit was not involved. There was very free hæmorrhage during the operation, and many vessels were secured and ligatured, but as a general oozing still continued at the deeper parts of the wound, Paquelin's cautery was

applied. The parts were then irrigated with carbolic lotion, and the skin flap secured with silver wire and horsehair sutures, and dry gauze dressings applied.

Nothing noteworthy occurred the next few days; the skin wound was dressed on the third day, and was found to have united by the first intention, so most of the sutures were removed, and two days later the remaining ones also. On the evening of Sept. 27th (six days after the operation) secondary hæmorrhage came on from the wound in the mouth after a fit of coughing, and was only stopped with great difficulty and after the patient had lost a large quantity of blood. From this time he made an uninterrupted recovery, and on Oct. 7th was sent to the Convalescent Home at Swanley.

On Nov. 11th, seven weeks after operation, the patient returned from Swanley, and it was then found that at the bottom cavity left in the mouth by the operation there was a raised patch the size of a shilling, soft and vascular, and the surface ragged and ulcerated. This was watched for a few days, and as it appeared to be growing it was determined to destroy it with chloride of zinc. In the first instance a paste composed of one ounce of chloride of zinc, two drachms of flour, and one ounce of liquor opii sedativus was employed. This was powerfully escharotic, but gave the patient great pain, and was not easy of application, so the following formula, suggested by Mr. Thomas Smith, was substituted: 100 grains of chloride of zinc, and one ounce of flexible collodion (half-strength). This was applied daily with a camel's-hair brush, caused very little pain, and acted very efficiently. By the middle of December the growth was quite destroyed, and a healthy surface left. On Dec. 23rd the man left the hospital, provided with a diaphragm and a set of artificial teeth. The rapid return of the disease pointed to the probability of a small portion of the growth having escaped removal at the time of operation, and not to a recurrence in the true sense of the word. Still, when the patient left the hospital, Mr. Baker gave a very bad prognosis, and said that it would probably recur before long. From this time nothing was heard of the patient till September, 1888 (one year after operation), when he wrote to say that he was perfectly well, and that there was no return of the disease. In September 1889, 1890 and 1891 patient again wrote, repeating what he said in his first letter, that he was quite well. In his last letter, Sept.

21st, 1891, he says : " I still continue in good health, and my mouth gives me no trouble."

Remarks by Mr. LYNDON.—The interest of this case lies in the fact that four years after excision of the upper jaw for rapidly growing sarcoma the patient is in perfect health, and there is no recurrence of the disease. At the time of operation a portion of the growth was set aside for microscopical examination, but unfortunately was mislaid, so that the diagnosis could not be confirmed microscopically. That the disease was malignant I think there can be no doubt. Its rapid growth in the six months before operation, its growth outwards to the cheek, downwards through the hard palate to the mouth, the invasion of the sockets of the teeth, and its rapid reappearance directly after the operation, together with its extremely vascular and soft and friable nature, point conclusively to malignant disease.

Lancet.

COCAINE.

By Dr. L. C. WASSON.

At the last meeting of the Society a resolution was passed instructing a committee, of which I was one, to make separate experiments with cocaine, for the purpose of determining its value as a local anæsthetic in the dental office. At that time, as many of you will remember, some discussion was had on the subject, and a great variety of opinions were expressed ; some claimed that cocaine was a most charming anæsthetic ; others that it was of no value, and there were a few who claimed that cocaine produced necrosis of the alveolus. That it was very uncertain in its action, and quite liable to produce dangerous constitutional disturbance, and therefore ought not be given a place in the dental materia medica.

In looking over our dental and medical journals of the day I have found quite as much difference of opinion among those who have written upon this subject. One author says he has used as much as six grains without getting toxic effects, and that he does not hesitate to inject two or three, or even six grains, if the exigencies demand it ; while another writer says you should never inject more than one or two grains.

M. Recluse, a celebrated French surgeon, reports eleven hundred cases where he has injected cocaine in all parts of the body for surgical operations without a single accident, and many others bear like testimony. But it is not to be denied that there have been some accidents with cocaine, whether they are the fault of the drug, or the injudicious use of it, I am unable to say. It is also true that accidents have happened with chloroform, ether, morphine and a hundred other of the most potent remedies in the *materia medica*: and yet no one thinks of discarding them simply because their use is sometimes attended with unfavourable results.

That there is an urgent need for a reliable local anæsthetic, no one will deny. Many things have been tried and found wanting. To-day there is nothing that I know of gives promise of filling a long felt want, as does cocaine. That its use and physiological action is not well understood is undoubtedly true, else there would not be such a wide difference of opinion as to its value as a local anæsthetic.

I have used cocaine in operations in the mouth one hundred and sixty times, with varying success; one hundred and twelve times upon females of all ages and conditions, and forty-eight times upon males. In my earliest experiments I used a two, four and ten per cent. solution. I soon abandoned the two per cent. solution because I found it unreliable, and commenced using a ten per cent. solution but found that I could get equally as good results with the four per cent. solution, and greatly lessened the danger of getting toxic effects. I have rarely, however, failed in greatly lessening the pain of extraction, and in a majority of cases the anæsthesia was complete, and the operation performed almost, if not quite, painless. I can hardly remember an instance where the patient did not express himself or herself as greatly pleased with the action of the cocaine, even though they did sometimes get toxic effects.

In those cases where I failed to get the desired results, it may have been because of faulty manipulation on my part, although I think it quite probable that there are cases where I could not get the cocaine deep enough into the gums to produce perfect local anæsthesia, for the reason that the alveoli are dense and hard, and the roots unusually long.

Cocaine is undoubtedly local in its effects, and does not reach beyond a very small radius, except where it is injected into the tissue in close proximity to some of the blood vessels.

and is by them absorbed and carried into the general circulation; in which case we are liable to have constitutional disturbances, which, to say the least, is annoying and unpleasant, although I do not believe it to be as dangerous as many who have written upon the subject, from the fact that so few deaths have occurred.

I had an experience, however, in two cases that was very surprising to me, and not at all satisfactory. Early in the month of June last, a young man was brought to my office who had had one of his superior central incisors broken off at the margin of the gum, by a blow. The pulp was exposed and bleeding, and as there was no possible way of securing the preparation of nerve paste, I decided to inject the pulp with a four per cent. solution of cocaine, which I did, and in a few minutes removed the pulp painlessly, greatly to the relief of my patient. After cleansing the root, I dressed it with a preparation of wood creosote, and packed it with carbolized cotton, sealing it with chlora-percha. I carefully examined the root and gum for a fracture of the alveolus, but could find none. I dismissed my patient with instructions to call again in a week, intending to put a crown on the root at that time. When he returned at the end of the week, he complained of tenderness about the root. In trying to remove the dressing, the root dropped from its socket, and a few days later I removed several pieces of the alveolus, all showing unmistakably signs of necrosis.

The other case was that of a young lady who came to my office complaining of pain in the region of the superior bicuspid on the left side. Upon examination, I found the pulp dead in the first bicuspid, and in the second the pulp was exposed and in a dying condition. I injected it with a four per cent. solution of cocaine, and in a few moments removed it without pain, dressed the root in the usual manner, directing the patient to call again in a few days, which she did, complaining of tenderness of the gums about the two teeth which I had treated. Much to my surprise I found the superficial plate of the alveolar process necrosed and completely honeycombed, so that when I used the syringe to wash the inflamed parts, the water came out through two or three fistulous openings in the gums. Query: Did cocaine have anything to do with producing necrosis in either case? If so, why have I not had other cases where I have injected the cocaine directly into the alveolus hundreds of times?

These cases came near together, and they, in connection with the fact that I got quite frequently toxic effects where I least expected it, did much to shake my faith in cocaine, though I felt loth to discontinue the use of a drug that seemed such a valuable adjunct to my practice.

I wrote letters to some of the most celebrated surgeons of the country, and got as many different opinions as I did letters ; no two of them agreeing.

About this time I learned from one of the prominent specialists of our city that he was using a preparation of cocaine with which he was getting much more satisfactory results than when using cocaine alone. He assured me that he had never seen a case of constitutional disturbance since he had been using it, nor had he had any other unpleasant results. This put new hope into me, and under the promise of secrecy I secured his formula, and commenced at once to use it ; since which time I have injected the solution sixty times without a single case of constitutional disturbance, or the least unpleasant results.

By permission of the gentleman from whom I obtained the formula, I am enabled to give it to you :

Cocaine hydrochlorate,	gr. 20.
Sulphate of atropia	gr. 1-10.
Carbolic acid, crystals,	gr. 10.
Chloral hydrate,	gr. 5.
Aqua pure, add one ounce.	

You will naturally inquire why the addition of the atropia, carbolic acid and chloral, make the use of cocaine less objectionable. I will try to explain : Atropia, in small doses, such as you give in hypodermic injections from this preparation is a cardiac, respiratory and spinal stimulant, which tends to counteract the toxic effects of the cocaine. 2. Carbolic acid aids the chloral in localizing the anæsthesia, and both tend to increase the anæsthetic properties of the cocaine and localize the effects, and both aid in the preservation of the solution, which is of itself quite desirable, as the ordinary cocaine mixture is almost worthless at the end of a week ; while this preparation is good for months.

In extracting, my plan is as follows : Fill the barrel of the hypodermic syringe with the fluid, then adjust the needle and make sufficient pressure on the piston of the syringe to force a few drops through the needle. By this means you obviate

the danger of injecting air into the tissues. Begin at the margin of the gum on the labial side, introduce the point of the needle, and gently push it into the gum tissues on a line with the roots as nearly as possible, and when a depth has been reached corresponding with the length of the roots, the needle should be slightly withdrawn in order to produce a small space or pocket into which five or ten drops of the fluid should be forced. Before the needle is withdrawn a slight pressure should be made upon the gum opposite the point of the needle. This scatters the cocaine and hastens its absorption by the alveolus. A similar injection should then be made on the lingual side of the tooth. If in withdrawing the needle any portion of the fluid should be directed to rinse his mouth. I usually wait from five to ten minutes after injecting the gums before extracting.

The amount of cocaine injected varies from one-half to two and one-quarter grains. If there is a number of teeth to extract, and conditions favourable, I do not hesitate to use a second syringe full of the fluid, or a total of one drachm ; but this is the limit ; I never go beyond it. The extraction of the teeth of course liberates a large part of the cocaine, hence more of it may be used for this purpose than where there is to be no bleeding. Should you get toxic effects with this preparation, administer a stimulant ; one of the best is dilute alcohol.

I have heretofore spoken of the use of cocaine for extracting only, but it is quite as valuable in the operating room, as at the extracting chair. In making deep buccal or proximal fillings, you can save much of the pain, as well as win the confidence of your patient, by injecting the gum with a few drops of cocaine before adjusting the dam. It is also invaluable in the treatment of pyorrhœa, and other inflamed conditions of the gums about the necks of the teeth. In short, cocaine intelligently used, will rob dentistry of half of its terrors, and win the grateful commendation and esteem of your patients.

Western Dental Journal.

Selection.

THE CROONIAN LECTURES.

On the Progress of Discovery Relating to the Origin and Nature of Infectious Diseases.

Delivered at the Royal College of Physicians, London.

By J. BURDON-SANDERSON, M.D., Ed., F.R.S., &c.,
Professor of Physiology in the University of Oxford.

THE ETIOLOGY OF INFLAMMATION.

Concluded from page 1053.

Staphylococcus in the Cornea.—The cornea can be best infected by introducing the undiluted culture into the wound made by a needle. The microphyte grows into the corneal tissue as it does in any other suitable medium, the only difference being that the colony assumes a form which is determined by the structure of the tissue. It consists for the most part of a system of subordinate colonies, which are arranged more or less distinctly in rows or tracts which branch from a central tract, but take their direction from that of the tissue, the whole forming a continuous system which has the puncture as its starting point. So much can be seen by examination with low powers. On more minute investigation it is found that each mass is sharply defined, and that it is surrounded by a zone of altered tissue. in which, if the preparation has been stained, the corneal tissue is relatively pale, and the corneal corpuscles appear to be wasted. The paleness is chiefly owing to change in the nuclei, which not only stain less, but are less sharply defined. It is easy to recognize in this zone the atrophic state which was described by Cohnheim in 1877, as the first stage in trigiminal keratitis. It can be observed distinctly eighteen hours after infection. About this time the migration of leucocytes goes on so rapidly that by the end of the first day the zone of atrophy is bordered by an outer zone of infiltration. The leucocytes are most abundant at the junction of the two zones; here, indeed they are closely packed, but further from the colony they run in tracts corresponding to the lymph splits of the tissues. The

elements themselves show signs of disintegration in the neighbourhood of the atrophic region, but are elsewhere normal. The result of the process so begun is that the whole of the tissue which is infected by the cluster-coccus, and which corresponds in extent to half the cornea or more, is destroyed ; in other words, that a corneal ulcer is formed, on the floor or surface of which the micrococci have mostly disappeared. At the edge of the ulcer the epithelium shows the signs of reparative growth (that is, it is thicker than normal, and many of the cells exhibit karyokinesis), while in the subjacent corneal tissue the reparative process is going on at the same time in the way also described by Cohnheim. The Bonn pathologists have, however, no doubt that in this process the nuclei which are seen in karyokinesis in the corneal tissue really belong to the fixed corneal corpuscles. In these facts we have the clearest evidence that the cluster-coccus is able to vegetate in the cornea, and there by damage its structure, and that this damage is followed by the normal reaction—i.e. the immigration of myriads of leucocytes. Why do these leucocytes appear on the field ? Metchnikoff says that they appear there for the purpose of devouring the microphytes. As to the fact that they do incorporate them, there is no manner of question. This point was not specially studied by the Bonn pathologists, but has been thoroughly worked out by Dr. Hess, whose observations are positive on the subject. The question what this means—that is, whether any such teleological meaning is to be attached to it—we shall have to discuss in a future lecture.

Staphylococcus in the Subcutaneous Cellular Tissue.—For subcutaneous injection the cluster-coccus may be used in the form of an emulsion, obtained by diluting a pure culture with salt solution. In Hohnfeldt's experiments the local effects were observed from four hours after injection. By the end of third day the cocci had collected into colonies. Long before this many of them were incorporated, not only in leucocytes but also in the epithelial lining cells of the capillaries. A little later a minute abscess had formed, and in its cavity exhibited obvious signs of degeneration, and the coccus vegetation extended beyond the zone of infiltration into the lymph spaces, but not to any considerable extent. The process of reparation did not begin until after the expiration of the first week. It was marked by the formation of new tissue—that is, of epitheloid cells with large distinct

vesicular nuclei and distinct nucleoli, immediately outside of the leucocytic infiltration. In these cells various stages of karyokinesis could be seen, particularly single and double stars, indicating great activity of germination. But it must be remembered that before this work of new growth, of reparation of damage, begins, the mischief-makers have disappeared. As in the case of the cornea, so here their work consists first in killing the living elements of structure within their reach ; and secondly in determining the initial phenomena of the inflammatory process—that is, active congestion, exudation, and emigration. This accomplished, they disappear. So far from profiting by this influx of nutritive material, it seems to be in the highest degree unfavourable to their further development. Whatever be the proximate cause of this cessation of growth and disappearance, we may, I think, properly connect it, as we always have connected it, with the multiplication of leucocytes. We shall return to this question later.

Staphylococcus in the Kidney.—We have seen (and the fact is familiar to everyone) that the favourite seat or secondary infective inflammatory foci in cases of osteomyelitis and of infective endocarditis is the kidney. Similarly when our microphyte is introduced into the circulation, it is in the kidney that it localises itself. Twenty-four hours after the injection of a syringeful of staphylococcus emulsion the organ shows streaks of grey in the medullary part, which I have already described. These streaks are simply collections of cocci which have plugged the bloodvessels, whether arterial or venous it is difficult to determine. The cortex is beset with very minute dots not larger than poppy seeds, each of which represents a colony or group of colonies, many of which exceed the convoluted tube in width, and therefore must have grown *in situ*. Each is surrounded by a zone of spoiled tissue, and that by a zone of cellular infiltration, outside of which the tissue is normal. Later each of these colonies becomes a small abscess, around which you have the double zone ; atrophy or necrosis inside, with cocci in the atrophied part ; infiltration of leucocytes outside ; then tissue showing signs of nuclear proliferation. Towards the end of the third day or later, these appearances become more distinct—that is, the abscess cavity is bounded by a zone of cellular infiltration, and that by a zone of nearly normal tissue, in which there may be karyokinesis of the epithelium of the convoluted and other

tubes, as well as of other tissue elements, probably vascular, occupying the interstices between them. It is to be borne in mind that this unequivocal evidence of proliferation does not present itself until at least three days after infection, long after the cellular infiltration has attained its height, and consequently that it affords no evidence of causal relation between germination of tissue and pus formation. The order of process is therefore, first necrosis, secondly emigration, and lastly proliferation of fixed elements indicated by karyomitosis. We surmised this to be the case before ; we know it to be so now.

Staphylococcus in the Lungs.—For the study of the action of the cluster-coccus on a vascular tissue, the alveoli of the lungs afford advantages not to be met with elsewhere. For in the lungs the relations between fixed elements of tissue and those which emigrate from the bloodvessels are relatively easy to appreciate. In the rabbit there is no difficulty in introducing staphylococcus into the alveoli : all that is necessary is to inject an emulsion into the trachea with a subcutaneous syringe. What happens is this. You get an exquisite lobular pneumonia. In twenty-four hours the base of the lungs is beset with minute indurations, varying in size from that of a hempseed upwards, which are more or less confluent, and follow the course of the bronchi. In the indurated parts the alveoli are full of cells which, I need scarcely say, are of two kinds—namely, small cells with one or more irregular shaped nuclei (i.e. leucocytes), and larger epithelial elements distinguished by their vesicular nuclei. From the first these cells contain cocci. Both kinds take part in the process of incorporation, but the epithelial elements much more than the leucocytes. At first the leucocytes are very numerous, but later they find their way into the bronchial tubes and the alveolar contents become more and more epithelial. Along with this occurs that process of coalescence by which in the lungs multinuclear or giant cells come into existence, all of which, like the smaller epithelial elements, contain incorporated cocci. What happens to these cocci ? They all disappear, but before they disappear they die. The proof of this has been given by Lahr. By bringing a calcined platinum needle into contact with a freshly exposed surface of the inflamed lung, and streaking with it the surface of an agar plate, the characteristic colonies are obtained any time up to the third day after infection. but they become less

and less abundant, until after the fourth day none can be obtained, however carefully or repeatedly the experiment is made. At this period cocci are still visible in the alveolar cells, but still they dwindle and lose their characteristic uniformity of size and contour. I would ask your special attention to these observations because they serve to exemplify in a very remarkable way how the same process—that is, the action of staphylococcus on living tissue may vary in its character according to the anatomical and physiological endowments of the tissue acted on. In the alveoli of the lung, they come into relation with a tissue in which the capillaries are protected by a scanty covering of epithelium—in which active congestion and exudation and emigration can be excited with extraordinary facility—and the encounter between microphite and cells occurs in the presence of oxygen. In the kidney there is no free oxygen, and the organisms appear in the first instance as capillary emboli. The want of oxygen and the organisms appear in the first instance as capillary emboli. The want of oxygen is favourable to the vegetation of the microphytes, and accordingly a colony grows wherever a single coccus is deposited. By virtue of their aggregation the individual cocci are effectually protected from any influence of their environment which might tend to check their growth, and are enabled to exercise on that environment their own characteristic toxic influence, each colony surrounding itself, as we have seen, with a zone of necrosis. In other words, the microphytes are, within a limited sphere of action, in the majority; whereas in the lung, by disseminating, and because the presence of oxygen is unfavourable to their growth, they are in the minority. In the one case they die and rapidly disappear; in the other they hold their ground and become the centres of infective abscesses.

We have already seen that in the cornea, where for similar reasons the cluster coccus grows just as it does in a tube culture, each colony is surrounded by a necrotic or atrophic zone, just as it is in the kidney, and the immigration of leucocytes from the conjunctival border is an event subsequent and secondary to this damage. There is another case which not only serves to exemplify the same principle, but is in itself full of interest. The case I mean is that of infective endocarditis. By clinical observation we know that mitral valvular disease is associated with the presence of infective inflammation in other parts, and that, on the other hand,

ulcerative endocarditis is antecedent to general infection. Recent researches have proved that in these forms of endocarditis our cluster coccus is more frequently concerned than any other; and now it has been shown experimentally that by introducing this microphyte into the circulation it is able to fix itself on the heart valves, and that, having done so, it is capable of destroying the epithelial lining and penetrating the sub-epithelial tissue. Why does it fix itself there rather than elsewhere on the internal surface of the vascular system? Probably because the surface is most remote from capillary blood vessels—that is, from the influence of actively living cells. Be that as it may, it is important to note that the action of the cluster-coccus on the endocardium is the same as on the cornea. It grows slowly, but holds its ground. It slowly damages a tissue, which, when once spoiled, has no power of recuperation. I have now completed the case against staphylococcus. It has been proved that it is one of the most mischievous of microbes—in short, that where mischief is, there it is almost certain to be found, and that wherever it enters, mischief follows. Speaking more definitely, it has been shown that its primary influence is to impair and ultimately annul the vitality of whatever living tissue is brought within the range of its influence. It has further been shown that it induces in all vascular tissues congestion, exudation, and emigration of leucocytes (that is, the first stages of the process of inflammation; how it does so is a question to be discussed later), and that it is very readily incorporated in actively growing cells whether epithelial or derived from the circulating blood. From the fact that in the lungs and elsewhere the infiltration of the tissue with leucocytes, and the abundant development in it of young cells, appears to be distinctly connected with the absence of the destructive effects which are observed under opposite conditions, it may be fairly inferred that these processes are protective—that is, that although they are themselves constituents of a morbid process, they conduce to the destruction or elimination of the *materies morbi*. But in the facts before us to-day there is nothing to justify the conclusion that the incorporation of microphytes in cells is the chief or only way in which the human or animal organism exercises its protective influence.

In concluding to-day's lecture with these statements as regards staphylococcus, I must ask you to bear in mind that

there are other organisms which stand in the same or in a similar relation to the process of inflammation. Of these I have to-day referred to streptococcus cursorily, as regards which it has been shown by a large body of evidence, clinical and experimental, that its action resembles staphylococcus in most respects. The question of the difference between them has been lately satisfactorily dealt with by M.M. Lannelongue and Achard in the research of which I have already referred. The results to which they have come are these: The visceral lesions produced by the chain-coccus differ only in degree—*i.e.*, in their being less intense, from those due to the cluster-coccus. Each is capable of producing osteomyelitis experimentally and may be the cause of it clinically. That two microphytes which are so easily distinguished in the laboratory should be almost undistinguishable in their action is a fact which evidently bears on the view to be taken of the relation between microphyte and its morbid action. This we shall have the opportunity of considering in relation to another phlogogenic microphyte, viz., the lung coccus, which plays so important a part in several infective inflammations. The main question relating to the etiology of inflammation remains to be discussed. It may, I think, be admitted that either staphylococcus or some similarly endowed anærophyte is the proximate cause of all acute inflammations which are met with in practice. Is it the only cause? Or can suppuration be produced by other agencies independently of microphytic intervention? On this question I shall be able to present to you clear evidence in my next lecture.

Reports of Societies.

STUDENTS' SOCIETY, NATIONAL DENTAL HOSPITAL.

THE last ordinary meeting of this Society was held on Friday, November 6th, at 8 o'clock.

R. Denison Pedley, Esq., President, in the chair.

The minutes of the previous meeting was read by the Secretary and confirmed.

The following gentlemen were present as visitors, and received the usual form of welcome from the President: Messrs. Woolf, Clarence Read, Arthur Read and Shefford.

Messrs. Timms and Shefford were elected members of the Society.

CASUAL COMMUNICATIONS.

Mr. CECIL BASCOMBE spoke of a case at present under his care. A patient came to him a short time ago with a distal cavity in a second lower molar, the wisdom tooth on the same side just erupting. There being no pain whatever in the second molar, the cavity was filled with amalgam. About three weeks later the patient returned in great pain, so the amalgam was removed and an oxyphosphate substituted. This, however, proved no better, for the patient returned in a very short time, and by advice the wisdom tooth was extracted.

In the anterior root of the wisdom was a small cavity, and the question to decide was whether it was caused by the elevator in extracting, great force having been used, or by some foreign body being in contact with the root and thus causing decay, the teeth by no means being in close apposition.

This led to a discussion in which the President, Messrs. Humby, Read, Rushton and Woolf spoke, the consensus of opinion being that the pain was caused by the buried wisdom tooth, and that the cavity in the tooth was due to the elevator.

Mr. Faro produced a model of the upper jaw of a patient 35 years of age, with the two temporary canines still in position. The permanent canines had come down just behind these, but had been recently removed by a dentist, he considering it too late to regulate them.

Mr. Read shewed models of two cases:—1. A displaced central, 2. An erupted wisdom in the palate.

A general discussion then took place as to the best disinfectants for dipping one's instruments into after using, in which the President, Messrs. Humby, Woolf, Reginald Bascombe and Nicholls took part, all being agreed as to the preference of boiling water to anything else.

Mr. Rushton was then called upon to read his paper on "Neuralgia."

A very long and interesting discussion then took place between the President, Dr. Maughan, Messrs. Humby, Read, Woolf and Clarence Read.

Mr. Rushton having briefly replied, the meeting was adjourned till Friday, Dec. 4th, when a paper will be read by Mr. Faro.

Dental News.

EMPLOYMENT OF UNQUALIFIED ASSISTANTS.

General Medical Council, November, 26th, 1891. Sir

RICHARD QUAIN, President, in the Chair.

The Registrar :—The notice of motion is “ That the Medical Council record on its Minutes, for the information of those whom it may concern, that charges of gross misconduct against persons registered in the Dentist’s Register in the employment of unqualified assistants, are, if brought before the council regarded by the council as charges of disgraceful or infamous conduct under the Dentists Act’ (Section 13.)”

Dr. Glover :—My motion is a very simple one and need not detain the council very long. I hope also it is reasonable in its character and will commend itself to the assent of the Council. I have to admit in the first place that the practice of dentistry is not so serious in its nature as general medical practice. No doubt there are one or two historical instances on record of wrong teeth being drawn, but the exceptions only prove the rule. But it is also undeniable, and I would produce evidence if it were necessary, that the practice of “covering” prevails to a very great extent in the department of dental practice. There are instances where men carry on dental practices in 8 or 10 of the provincial towns of England. (Hear, hear), and it is believed that that is largely done by unqualified assistants. Be that as it may the Associations concerned with the practice and honour of dentistry having tried to prove instances of covering, and having found the results not altogether satisfactory, have very naturally come to us with a memorial to ask this Council to extend to dental practice the same principle that they have extended to ordinary medical practice. The only objection I can see to be made against this proposal is that it might involve the Council in a considerable extension of its business, and possibly in some extension of its expenditure. We have the assurance of the dental profession that they will not put this Council to any expense, and that if the Council will deal with these cases on the same principle that they now apply to medical cases the Dentists will themselves undertake all the expensive part

of the identification and the prosecution of cases. I hope therefore the Council will accept this resolution. We represent not medical practitioners only but dental practitioners. A large proportion of these gentlemen are not only dentists, but they are also members of our profession, and are on the Medical Register, and it is to that section that we must look for the elevation of the whole branch of their practice. I am sure that the acceptance of this resolution by you as a Council will be a great source of strength and support to these gentlemen. I have great pleasure in moving the resolution.

Mr. Macnamara; I second that motion. I have been pressed very much on this subject by the registered dentists in Dublin, to urge upon this Council the acceptance of some such resolution as this. I have tried, and in some cases in vain, to explain that it is not within our power to meet the grave evil of which they complain: that we can only deal such cases as are on the Dental Register. There is a whole host of so-called Dentists squatting about the country now, and they are doing a great amount of injury to the Dental Profession, but they are altogether outside our reach. Still they would be glad if some such resolution as has been proposed by my friend Dr. Glover, should be adopted by this Council. When I tell you the leading members of the Dental profession in Dublin are almost without exception Fellows of the College of Surgeons in Ireland, I think what they wish to be done, we should try and meet. I have great pleasure in seconding this resolution. It will strengthen their hands, and it will, I think, be considered that they are entitled to it, inasmuch as they are on our Register, and they have paid certain fees for that purpose.

Sir John Simon:—I think we should be somewhat cautious in the matter of dealing with a general resolution of this kind. I am quite ready to deal with individual cases brought before the Council. If there was brought before us a case of gross misconduct becoming grave by reason of ill consequences resulting from it, I should be quite prepared to deal with that individual case on its own merits and the Council, if such cases are brought before them, will see their way to deal with them as they deserve to be dealt with. But as regards passing a general resolution I see some difficulty in it. I do not like any needless projection of thunder-bolts and I think that the cases do not constitute such a mass as to require a general resolution. I think it will be understood as a matter of common

sense that if such cases as I have described come before us we should deal with them in the same spirit as we deal with medical abuses under the Medical Act ; but really we have not got in our minds so far as I know any very definite cases of the kind referred to. There may be such cases, but we have not sufficient experience of them to be able, I think, to define them very clearly in our own minds. Let me remind the Council that when we passed our resolution on the subject of unqualified practitioners and the dishonest employment of unqualified assistants by qualified practitioners, the resolutions passed were arrived at on the report of a committee that had very considerable opportunity of investigating the subject, the chairman being Dr. Chambers, whose report is upstairs, giving the result of inquiries made by him personally, and of investigations made by the Committee sitting upstairs, who went into evidence pretty fully and having very clear notions as to the evils with which they had to deal, passed certain resolutions. I myself had the pleasure of drafting them, on which the Council have taken action, and which it is proposed to apply to dentists. But we do not know the case of the dentists, and we knew the case of the unqualified practitioners. There is the widest possible difference in degree of importance between the two cases. I think we shall do right in this matter if we deal stringently with any extreme cases that are brought before us. If a man pulls out a tooth wrongfully, it is hardly a case to bring before the Medical Council. It is not quite on the same footing, as the case of the unqualified practitioner. We do not put it on quite the same footing as the terrible abuses with which we are brought face to face in the general profession. I say we do not thoroughly know the cases, we have not had experience of them. If ever a general resolution of this sort were necessary, I think it ought only to be after we have considerable experience of such abuses. I will finish by pointing out the reason for caution in this matter. When we decidé under the Medical Act that certain practices constitute infamous conduct in a professional respect there is no appeal from our judgment; but in dentistry there would be an appeal. Under the Dentists' Act there is an appeal to the ordinary Courts of Justice from such a sentence as ours. I think we ought not, on right grounds, to put ourselves by general resolution in a position that would expose us to more litigation in the discharge of our duties. I think

caution is requisite about that. I do not think the resolution ought to pass.

Mr. Macnamara read the memorial received from the British Dental Association, which he said was pretty good evidence that in the opinion of Dentists some such step as was proposed was absolutely necessary.

Sir Walter Foster :—I only want to say one word. I think the spirit in which the resolution should be received by the council has not been very successfully interpreted by Sir John Simon. By the desire, by the request of the dentists as a profession, I think we ought to be favourably impressed. They are anxious to keep their profession as pure as can be from all mal-practice, and I think that the attitude that this Council has taken with reference to the Medical profession has given them a kind of ideal standard which they are anxious to attain. I do not think we need have any timidity in putting on our minutes a resolution of the kind proposed by Dr. Glover ; because surely this Council is wise enough and cautious enough not to take up frivolous cases. Therefore I think we are justified in saying to the dentists we shall do all that we can to enable you to keep your profession as pure as we believe everything connected with the treatment of human ills ought to be.

Dr. Moore :— I hope the Council will adopt this resolution. Some of the most educated men in Dublin are those holding degrees in the profession of dentistry. They are imitated by unqualified and unregistered practitioners, and I think it is very important that they should be protected. If the prevention of covering is good in the medical profession, I do not see why it should not be equally good as applied to dentists. Tho Dublin dentists are a most respectable body of men.

Sir William Turner : I share very much the feeling expressed by Sir John Simon in this matter ; I do not think we have got quite sufficient information before us to enable us to lay down quite so wide a proposition as is expressed in this motion. If Dr. Glover could see his way to modify his motion in this direction, that a committee should be appointed to enquire into the subject of the employment of unqualified assistants in the Dentists' profession, and the nature of the abuses, very much indeed as was done in connection with ourselves, I should be quite prepared to support it. As regards myself, I do not feel at this moment that I quite

understand the full import of this motion, and how much it may cover. We all know, for example, that all dentists in good practice employ a large number of mechanics; well, I suppose that those gentlemen are not qualified in the ordinary technical sense of the word. Are those gentlemen to be brought under the censure of this Council? I mean the gentlemen who employ the "unqualified" mechanics? I think we need a little more information, and I think it would answer not only Dr. Glover's purpose, but it would also show that we were in sympathy with the wishes of the profession of Dentists, if we at this stage appointed a committee of inquiry.

The President.—There is the Dental Committee.

Sir William Turner :—But that is to enquire into individual cases.

The President :—When they come before us. I was going to suggest, Mr. Macnamara has read a memorial from the Dentists, if he were to move that that be entered on our minutes and follow that by a resolution that the Council will be prepared to entertain a statement from the Dentists showing what these matters are that might produce good results.

Sir John Simon : With a request for such information.

The President :—I think that would do.

Sir John Simon :—That the Executive Committee would be glad to receive any information upon the point.

Dr. Glover :—I wish to meet the views of the Council on this matter. I quite admit that any general rule of this sort would not cover gentlemen assisting Dentists as mechanicians; that is clearly excluded by the rules which carefully lay down that an assistant, resident in the house, and acting under immediate supervision and instruction is not included. Therefore, there is our own rule to follow in not including the dentists' mechanical assistants.

The President :—If you would allow Mr. Macnamara's memorial to be entered on the minutes, and follow that by a resolution that the Council would be prepared to deal with cases.

Mr. Macnamara :—I move that this be entered on the minutes.

The Registrar :—It is already on the minutes.

The President :—Follow that by a resolution.

Sir John Simon :—I shall be very happy to second it if Mr. Macnamara will propose that this memorial having been entered on the minutes be referred to the Executive Com-

mittee with the request that they will receive any information which the Dental Association can give on the present employment of unqualified assistants and the abuses to which that practice may give rise.

The President :—I thought it would be better that the Memorialists should be informed that the Council will be prepared to receive any statement on the subject.

Sir John Simon :—There is the Dental Committee.

The President :—That is a special Committee. It costs 25 guineas a day.

Dr. Glover :—I will accept the proposal that this memorial be referred to a Committee; I do not care whether it be a special committee, or the dental committee.

Sir William Turner :—The Dental Committee has specific powers under the Act; it is appointed by the Act for a specific purpose.

Mr. Glover :—Not for such a purpose as this.

Sir William Turner : No.

Dr. Glover : Then let us have a special Committee. I propose that this question of the memorial be referred to a special committee.

Sir William Turner : The Executive.

Dr. Glover : No, I think a special committee; I should prefer a special committee.

The President : I suggest that the Dental Association who present that memorial may be requested to send to the Council a statement of the cases to which they refer and the Council will take action upon them.

Dr. Glover : I prefer a special committee; I think the Dental Committee is already over burdened with work.

The Registrar : It deals with cases specially referred to it by the Council : "That the Memorial of the British Dental Association be referred to the Executive Committee, and that the Association be requested to communicate to the Committee any cases of gross misconduct in the employment of unqualified assistants." Something like that would meet it.

Sir William Turner : Dr. Glover will facilitate what he has in view if he has it referred to the Executive Committee, because the Executive Committee will meet in February, and can then deal with such evidence as the Representative Board of Dentists may wish to offer; whereas an ordinary special

committee, such as he proposes, would not in all probability meet till May next.

Dr. Glover :—I shall accept the suggestion and propose “That the President be requested to inform the memorialists that the Council has referred their memorial to the executive committee, which will be prepared to receive such formal complaints of gross misconduct of the kind referred to as may be laid before it.

The resolution was put to the Council and agreed to.

HYPNOTISM.

A Lecture to the Medical and Dental professions on the above subject was delivered on the 13th inst. by Mr. George André, at the Hanover Rooms, London. After giving a short account of the history of Hypnotism and explaining its various alleged uses, methods and stages, its application to Art, Surgical and Dental Operations, &c., its asserted curative powers in various complaints such as pains, hysteria, etc., he demonstrated on four of his own subjects whom he had previously chosen for the purpose. He demonstrated the various stages of hypnotism, lethargy, fascination, catalepsy, and somnambulism; among various examples, he produced on one of those selected an imaginary violent toothache, then the lecturer asked him if he had a bad tooth in his mouth, and as he replied in the affirmative, he asked if he would like to have it out, and he said “very much indeed.” Mr. André asked “Which is the tooth?” and he tried to show with his finger which, but was astonished not to find it, and appeared puzzled at the loss but not in any way expressing pain.

At the termination, a gentleman, we suppose of the dental profession, offered himself to Mr. André to be hypnotised, but was not accepted. Mr. André stating that it required some time, and the hour being advanced, he could not very well do so, and also an objection was made to his middle age. Mr. André preferring subjects between 14 and 30 or 35 for the first influence, finding it easier to hypnotise within those ages. He observed that the first time it is always more difficult, and requires longer time, but when a subject has been hypnotised before by the same operator, it requires a very much shorter time for any subsequent experiment. And further, that it is more

difficult to hypnotise people with weak intellect, and that nervous people were the best subjects. It would have been much more satisfactory if Mr. Andre had not refused the voluntary offer of the gentleman, as to be of any use for dental operating, the patients or opportunities cannot very well be specially selected.

This refusal to experiment on an independent subject appeared to reduce the satisfaction that otherwise might have pervaded the onlookers, and necessarily cast considerable doubt on the efficacy of hypnotism for practical purposes.

At a post-mortem at Brooklyn, N.Y., U.S.A., of a man 40 years of age, who died suddenly, there was found in his stomach a curious collection of nails, chunks of coal, buttons, little pieces of tinware, stones of various shapes and sizes, and a variety of other articles. He was somewhat weak-minded, and had been placed in an asylum, where he was allowed to move about as he pleased. He was frequently seen putting pieces of coal and stones in his mouth, and, strange to say he boasts that he could chew a stone. In a quarrel with a male attendant of the institution he seized his watch-chain, and, putting it into his mouth, began chewing vigorously, the whole chain being swallowed without any apparent inconvenience.

APPOINTMENTS.

Marcus Davis, L.D.S., F.R.C.S., Edin., has been appointed Senior Dental Surgeon, at the National Dental Hospital.

VACANCIES.

The Dental Hospital of London, Leicester Square.—Dental Surgeon; must be Licentiate in Dental Surgery. Applications with testimonials to be made by December 12th to the Secretary, J. F. Pink.

The Dental Hospital of London, Leicester Square. Assistant Dental Surgeon; must be Licentiate in Dental Surgery. Applications with testimonials to be made by December 14th, to J. F. Pink.

The Dental Hospital of London, Leicester Square. Assistant Anæsthetist. Application with testimonials to be made by December 14th, to the Secretary, J. F. Pink.

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ANÆSTHETICS.*

By Mr. ALEXANDER WILSON, F.R.C.S.

Senior Administrator of Anæsthetic, Royal Infirmary,
Manchester. Administrator Anæsthetics, Victoria Dental
Hospital.

Concluded from page 1067.

I propose to-night to leave out, as much as possible, the experimental side of the question, and consider the subject mainly from the standpoint of the action of these anæsthetics upon human beings.

Ether has a specific paralysing effect on the higher cerebral centres and the sensory nerves. Its action on the sensory nerves seems to be slightly in excess of that on the cerebral centres : that is, with a given degree of consciousness or semi-consciousness, there is a greater degree of anæsthesia than there is with chloroform or other anæsthetics.

In its physiological action on the organs intimately concerned in maintaining life, is that generally indicated by the name of stimulant. It quickens the action of the heart, makes the pulse quicker and more full, it produces increased blood pressure, causing increased rapidity and fulness of the respiration, it stimulates the respiratory centre, and when death results from its action it is by a gradual paralysis of the respiratory centre, this paralysis, from the nature of the drug cannot be brought about suddenly.

It is to be remembered that this excessive activity of the circulation and respiration gives place to a depression, after the ether has been administered for some considerable time, *i.e.*, after an hour or so, this need not be taken into account

* A paper read before the Manchester Odontological Society.

in dental operations. The activity of the circulation, and the high blood pressure, counteract any tendency to faintness or syncope, there is no danger in giving the drug with the patient in an upright position, and there is little or no risk of the shock of an operation causing syncope, when the patient is semi-conscious.

It is, bulk for bulk, a less powerful drug than either chloroform or methylene, and this alone constitutes an element of safety in its administration. It is a less toxic drug than chloroform.

Thus, to produce unconsciousness sufficient for a surgical operation, it is calculated that at least 4 fluid drams of the drug must be in solution in the blood, and about this amount must be kept in the blood to maintain unconsciousness.

This amount takes some time for its inhalation, a fatal dose, would have to be larger, and would require more time, with so weak an anæsthetic it is almost impossible for an over dose to be suddenly inhaled.

It is different with chloroform, 18 minims absorbed into the blood is enough to produce surgical anæsthesia, this and more can be taken in a few deep inspirations, as we shall see later on.

Properly administered with a good inhaler, it is attended with less struggling and excitement than chloroform, the patient can be got under much quicker with safety, in short operations the return to consciousness is quicker, the after sickness, though nearly always present, is not so long continued as that from chloroform. In addition to these, it has the very great advantage of lending itself most aptly to admixture with nitrous oxide. The two seem to have been made to go together, they so exactly supply each other's deficiencies.

To set against these advantages the opponents of ether quote certain objections.

1. That it is intensely disagreeable to inhale.
2. That it takes a long time to produce its effects and causes violent struggling.
3. That it creates a profuse secretion of saliva, and mucous from the air passages.
4. That it produces bronchitis.
5. That it cannot be used by artificial light.
6. That it requires some apparatus for (its) giving it.

These exceptions are all true, and they are not true. True

in the sense that, it is possible so to give ether, that they can all be brought out prominently—and not true, in the sense that ether can be so given that, except a little salivation none of them will be noticed.

The slowness of its action is simply a tradition of the by-gone days, when it was administered with a towel and a sponge, and a pint or so used in half an hour, the same applies to the danger of using it by artificial light. With a good inhaler, Clover or Ormsly 3 to 4 minutes at the outside will suffice to produce insensibility, and unless the artificial light is placed almost inside the inhaler there need be no danger from that source.

The amount of secretion never so excessive as sometimes described, depends greatly upon the mode of administration. Slowly given it is very little, given preceded by gas, it is scarcely appreciable and it is never enough to interfere at all, with dental operations. It is an advantage, with sticky mucous in the mouth, the risk of a stump being sucked into the larynx is lessened. The bronchitis bugbear, I do not greatly believe in, it also is probably a relic of the old method of giving ether, when a large amount was used, and from the mode of administration by some open inhaler, a mass of chilled air was constantly introduced into the lungs.

If we turn to consider the fatal cases from ether, we find them variously estimated at from 1 in 23,000 administration to 1 in 10,000. In all cases the onset of death was gradual and in all cases the subject was diseased.

It is stated on good authority, that there is not a single case on record, in which ether has caused the death of a healthy individual. Of course, this is contradicted, but it is to the credit of ether that the making of such a statement is possible, for there must be some truth in it.

These advantages of ether are evident, but there is no concealing the fact, that it is troublesome to administer, especially when given alone. To anyone thoroughly conversant with, and accustomed to the use of chloroform, it is at first a downright trial to habituate himself to the giving of ether, it is much more troublesome than chloroform in small details, and less clean. Still, with it, though there are more little worries, there are certainly fewer serious ones.

Given with nitrous oxide, it is altogether a different matter, all its objections disappear. In surgery there are many cases in which ether cannot be given; but in dental operations there

is no reason why, as a routine practice anything else should ever be used. The objection that its prolonged administration is dangerous does not hold good in dental surgery where few operations last more than fifteen minutes.

CHLOROFORM.

Chloroform was discovered some 280 years after ether, and is probably the most largely used anæsthetic we possess.

It owes this popularity to certain valuable properties. It is very portable, little is required to produce anæsthesia; beyond a piece of lint or a handkerchief—no apparatus is needed for its administration—it produces complete anæsthesia, it is pleasant to take. Altogether, it is an admirable anæsthetic; but, it has a high death rate, whether this is because it has in some cases, a specific paralysing action on the heart, or whether it is because some patients cannot “stand it,” or that it is particularly difficult to administer does not matter much. The fact remains that a certain number of persons who inhale it die, in a proportion variously estimated at from 1 in every 2,500 to 1 in every 5,000. These fatalities are due solely to the anæsthetic, as they almost invariably occur before the operation. Another feature is this, they do not happen more often in delicate persons than in strong ones, a healthy person is almost as likely to die from chloroform as an unhealthy. It seems, curiously to happen, that robust individuals furnish the large bulk of the deaths from chloroform. Further, fatal accidents occur in patients who have previously successfully taken chloroform. (In one case a man died who was having the drug given for the ninth time.) In regard to the nature of the operation, out of any large number of cases, a considerable number are found to be dental operations, (*e.g.* out of about 120 deaths in 1878-1888 ten were dental cases). What is the explanation of these fatal cases? One is the smallness of the lethal dose and the ease with which the patient can help himself to an over dose.

It has been worked out years ago that 18 minims of C. absorbed into the blood will produce surgical narcosis. Now! twice that amount 36 minims at 60° F. could be contained in 300 cubic inches of air, and could be inhaled in twelve inspirations. If only half of this were absorbed, it would be enough to produce insensibility, and if the air in the lungs, some 250 cubic inches, were also saturated with chloroform vapour at 60° F. it would contain 30 minims, which when absorbed

would be more than sufficient to cause paralysis of the respiratory centre.

Thus, once insensibility has been induced, an inspiration or two of air charged with chloroform vapour, may bring about a fatal result. This cannot so readily happen with ether. Whatever theories are advanced as to the cause of death, or whatever new directions are given for its administration, the facility with which an overdose can suddenly be inhaled by the patient will always constitute a prominent danger with chloroform, a danger not possessed in an equal degree by other equally efficient anæsthetics, notably ether.

While, noting the deaths from chloroform, it must be remembered, that it is the most largely used of any anæsthetic (except perhaps $N_2 O$), that the majority of medical men who give chloroform fairly, frequently pass their entire lives without having, or even seeing, an accident from it, and that, there are surgeons who, out of thousands of administrations have never had a death.

It has probably in this country more advocates than has ether, in America the reverse is the case.

The physiological action of chloroform is similar to that of ether, it has however, a more depressing action upon the vaso-motor and respiratory centres. It used to be stated that chloroform might cause death in one of three ways, (1) by producing gradual paralysis of the respiratory and vaso-motor centres, (2) by inducing sudden paralysis of the heart, (3) by syncope produced by the shock of the operation on a semi-conscious patient.

The very extensive and carefully performed experiments of the Hyderabad Chloroform commission have not confirmed the truths of these ideas as to the mechanism of death from chloroform and there is far from being a uniformity in the views of physiologists on the subject. I need not trouble you to-night with going into it. It has been amply proved that animals can very easily and quickly be killed with chloroform, and that the same result, accidentally happens in human beings, when apparently every care is taken to prevent it.

Briefly, the disadvantages laid against chloroform are, Patients, especially males, struggle often very violently when "going under"—it is slower in its action than nitrous oxide and ether—it cannot safely be given in the upright position (its strongest advocates admit this)—in the semi-conscious condition the dangers from shock are increased—the patient

does not recover consciousness as quickly as from gas and ether—finally a number of deaths have occurred with chloroform, when apparently, due care was used, a fatal dose can easily be taken. Altogether, apart from its real or imaginary dangers, it does not lend itself so comfortably to dental operations as does the mixture of gas and ether. As a pure matter of convenience and pleasantness gas and ether is better than chloroform.

NITROUS OXIDE AND ETHER.

In the combination of nitrous oxide and ether we have the most perfect anæsthetic agent at present available. The advantages of both are fully obtained without the disadvantages of either. There are combined all the best features of nitrous oxide, its pleasantness, and its rapid action with the prolonged anæsthesia of the ether.

The patient passes quickly under the influence of the gas, and once unconscious, the ether is gradually turned on, and insensibility can be maintained indefinitely by its action.

There is no struggling, no coughing, or resisting the ether, and the salivation is reduced to a minimum, or is entirely absent.

There is further, the great advantage that the anæsthetic effect can be carefully graduated. If only a little extra time is required a little ether, with the last bagfull of gas will sensibly prolong the nitrous oxide anæsthesia without leaving any ill effects in the way of sickness. The stimulating effects are most marked.

There is no need to dilate upon the phenomena of the nitrous oxide and ether anæsthesia, they are similar to those produced by either alone. Of course it requires practice to be successful with it.

The time at my disposal does not permit me to notice methylene, bichloride, and other anæsthetics. My experience of them has not been really extensive, and not such as would lead me to prefer any of them before gas and ether or chloroform as routine anæsthetics.

In conclusion, I would like to tell you that I began my career as an administrator of anæsthetics, with a strong prejudice, in favour of chloroform. As sole administrator of anæsthetics to the Manchester Royal Infirmary during the last four and a half years, my total number of administrations of anæsthetics amounted to about 5,000, the great majority

of which were chloroform cases. It was after an extensive experience with chloroform that I began to use ether, and now, though I would never hesitate to use chloroform, I infinitely prefer gas and ether. This preference for ether (given with gas), is also shared by certain surgeons, for whom I previously used to give chloroform. The transition from the use of chloroform to that of gas and ether was easy, and the advantages self-evident, but I admit it was with difficulty that I broke myself into the habit of giving pure ether.

ON A NEW METHOD OF PREPARING SECTIONS OF TEETH AND BONE, TO DEMONSTRATE THE HARD AND SOFT TISSUES IN COMBINATION.

By A. HOPEWELL SMITH, M.R.C.S., L.R.C.P., L.D.S.

Mr. President and Gentlemen,—The subject of my communication to your Society this evening is one which I believe will be of interest and importance; of interest, because it is a new treatment of a subject that has been introduced to you on a previous occasion; and of importance because, by it, new fields of research will be opened up and new departures in microscopical work effected.

It will, therefore, I hope, prove to be a valuable accession to our power of investigating and becoming more acquainted with the histology and pathology of the dental tissues, and will materially add to our knowledge a clearer comprehension of certain points which have been, and are still, somewhat problematical and wrapped up in obscurity and doubt.

To Mr. Mummery must be given more than a meed of praise for his excellent paper read last year. The process he advocates, though difficult to follow, is scientific and productive of most faithful results. It is nevertheless a fact that much time must be given for its proper performance, and this, combined with its complex nature, renders it tedious and at times disheartening.

With a view to obviate these difficulties, and as an adjunct to other processes, I have been, for some months past, adopting a new method of preparing sections of teeth and bone, which is simple, extremely successful, and followed by most satisfactory results.

The three great principles underlying this process are : (1) hardening or "fixing" the soft tissues, (2) complete decalcification of the hard tissues, and (3) their thorough impregnation with gum or celloidin preparatory to cutting by means of a microtome.

The employment of decalcifying agents has, of late years, been strongly deprecated as being an unscientific mode of procedure. But it is recommended by many of the leading histologists of the day. Schäfer* suggests the use of picric acid as a bone decalcifier; Kleinenberg† advises picric and sulphuric acids, while Ebner's‡ solution contains hydrochloric acid, alcohol and sodium chloride. Further, decalcifying fluids are used by such practical histologists as Lee, Klein, Colman, &c. The latest writer on the subject, Dr. R. Haug§ advocates a combination of nitric acid, alcohol and Na Cl, and speaking of its action he says : "This solution decalcifies rapidly without destroying the tissues, and may be used for bone of all densities and ages. . . . Preparations stain well after this method." And Dr. John Hart, of New York, describes in the *Dental Cosmos*, for September, 1891, a method of preparation, by immersing previously ground-down slabs of dentine and enamel in a 6 per cent. solution of glacial acetic acid for ten hours.

Thus the use of softening re-agents would seem to be perfectly legitimate, and personally speaking, I have found the results compare most favourably with sections prepared by methods of grinding down or cutting without decalcification.

In considering the subject of this paper, it will be convenient to describe it in three parts :—

(a.) A brief account of the process.

(b.) Its advantages.

(c.) Its results.

(a.) As already mentioned, the mode of procedure advances in three stages ; first, fixing and hardening the soft tissues, secondly, softening the hard tissues ; and lastly, impregnating them with suitable re-agents for cutting on a microtome.

(1) A perfectly fresh tooth is taken, and, having been quickly washed in water, is immediately placed in a solution of bichromate of potash 2 per cent. with sulphate of sodium

* "Pract. Histology," 1877, p. 182.

† "Crookshank's Pract. Bacteriology," 1890, p. 26.

‡ Idem. p. 25.

§ Zeit. f. Wiss. Mikr., viii. (1891), pp. 1-11.

1 per cent. and distilled water, otherwise called Müller's fluid and here it remains for from three to four weeks. It may be necessary to enlarge the apical foramen with a fissure bur on the dental engine.

For "fixing" and hardening the soft tissues Müller's fluid is by far the best re-agent to employ. It possesses great penetrating power, does not cause shrinkage of the cells or fibrous tissues, and hardens them uniformly. The amount of the fluid should exceed the bulk of the tooth by about twenty times. It should be put into a glass-stoppered bottle, changed on the fourth day and again at the end of a fortnight; after which time the tooth must be removed for ten to twenty days to alcohol (84 per cent.), which completes the hardening process. The tissues of the pulp will then be found to have become rather tough, the cells will be unaltered in shape, there will be no recession from the hard dentinal walls, and no imperfect coagulation of the tissues. Sometimes blood corpuscles will be retained in the capillary vessels of the pulp. In some cases, alcohol (84 per cent.) may be used instead of Müller's fluid, the tooth then remaining in it for the same period of time or even longer.

(2) The tooth is now removed from the hardening fluid, well washed in water, its apical foramen closed or the soft parts covered with collodion and then immersed in an acid solution consisting of—

HCl (pure), 12 parts.

HNO (non-fuming), 30 parts.

Aqua dest., 108 parts.

This is to be used in the following manner:—The tooth—a canine or bicuspid for choice—is placed in a Wolrab's gold cylinder bottle containing 12 c.c. of a 10 per cent. solution of HCl, which must be freshly made. At the end of fifteen hours, 1.5. c.c. of non-fuming HNO₃ are added to the solution, and the same repeated at the end of forty-eight hours.

After immersion for from seventy-five to eighty hours for molars decalcification is complete and the tooth removed. (This is not absolutely correct for temporary and small permanent teeth, which naturally require a shorter immersion than that stated. The operator must be guided by the amount of softening that has already taken place.) The tooth should then be placed for half an hour in a solution of lithium carbonate or sodæ bicarb.—5 grs. to the ounce—and then thoroughly washed in distilled water.

Rapid decalcification of dentine and cementum is thus brought about—a matter of importance, I believe, for their structural relations are unaltered and the pulp and periosteal tissues unaffected: an event which would soon occur if prolonged immersion were tried. For, as Trinkler points out, the combination of HCl and HNO_3 leads, after a week, to the evolution of free chlorine, an agent which would not only bleach but probably destroy the dental tissues. If teeth are not sufficiently softened at the end of eighty hours, a fresh solution must be used.

The above fluid is a diluted form of “aqua regia.” What precise chemical changes occur in dentine and cementum it is impossible to say; histologically they both appear to be unaltered in structure; the inorganic materials being removed, while the organic substances remain *in statu quo*. Moreover, something more than a mere skeleton of the bone is obtained. Another advantage in using HCl and HNO_3 is that they are both colourless and therefore do not stain the tooth like picric and chromic acids.

(3) The next step is removal to gum mucilage—gum 2 parts, water 3 parts, and carbolic acid 10 drops to the ounce, or an alternative plan of imbedding in celloidin may be adopted. The latter is most useful if the tooth is sufficiently soft. It is important that it should be divided into several pieces by a razor to allow of complete impregnation with gum. This generally takes place in from twelve to fifteen hours, but a good criterion is afforded by the tissue falling to the bottom of the glass bottle and no longer floating on the surface of the medium. Should incomplete impregnation occur, the tissues will be displaced by the movements of the microtome plough. Each piece of tooth is then placed on the stage of the freezing microtome and cut in the ordinary way.

The most useful stains are orange-rubine, AuCl_3 (according to Mr. Underwood's plan), borax-carmines or Weigert's solutions. Most excellent results are obtained by using orange-rubine as a general stain in the following manner: the sections should be well washed in distilled water, transferred on a section lifter to a diluted solution of orange-rubine (1 part stain to two parts distilled water) and left there for twelve hours. They are then passed through the strong solution, all excess of stain washed off by irrigating with distilled water, and subsequently placed for three minutes in absolute alcohol, which dehydrates them. After “clearing” for one-and-a-half

minutes in cedar oil, they are permanently mounted in Canada balsam.

The steps of the process may be briefly summarised thus :—

1. Immerse a newly-extracted tooth in Müller's fluid for three to four weeks, and remove to spir. vini. rect. for ten to twenty days. Alcohol (84 per cent.) may be used instead of Muller's fluid.

2. Remove, wash in water, and seal up apical foramen with collodion.

3. Place tooth in 15 c.c. of following solution :—

HCl 12 parts.

HNO₃, 30 parts.

Aq. dest., 108 parts.

Take 12 c.c. of 10 per cent. solution of HCl, and at end of fifteen hours add 1.5 c.c. of HNO₃ and at end of forty-eight hours add 1.5 c.c. of HNO₃ from commencement of immersion in acid solution.

4. Remove tooth (molar) at end of seventy-five to eighty hours and wash in solution of lithium carb. (5 grs. to an ounce) for half an hour. Wash thoroughly with distilled water.

5. Divide tooth by razor into several pieces and wash again in water. Place each piece in gum mucilage (B.P.). Leave in mucilage twelve to fifteen hours.

6. Transfer to stage of freezing microtome, cut, wash sections and stain with orange-rubine, or gold chloride, or borax-carmin, or Weigert's solutions.

7. Dehydrate in absolute alcohol three minutes, "clear in cedar oil one and a-half minutes, and mount in Canada balsam.

(b) *The advantages of the process.*—In speaking of the value of certain re-agents, I have already had occasion to refer more than once to the primary object aimed at in the employment of this method. To repeat, this is the retention *in situ* of the soft tissues—whether anatomical or pathological—in such a manner that the morphology of the fibrous, cellular and vascular elements of pulp and periosteum, in conjunction with cementum and dentine, is in no wise altered and disturbed. Macroscopically this is easily observed, but it is only microscopically that its real value becomes apparent.

Further, although decalcifying agents are employed, it is nevertheless a fact, curious as it may seem, that the results are more faithful, and approximate more closely to the struc-

ture of the living tissues than "dried" sections of teeth and bone.

There is a vast difference between the skeleton of a tooth and its normal structure. Therefore the first great advantage is that soft parts are retained in normal relationship to the hard tissues. The process is also valuable for the ease and rapidity of its performance; and it is a very simple one. The less complicated the method the more true to nature the results. Again, any number of sections may be obtained from one and the same tooth; and they can be cut so thin that their specific gravity is only a little higher than that of water. Moreover, it is particularly useful for dental pathology, as well as anatomy and comparative anatomy. Stains penetrate quickly and permanently. Sections of spinal column, with the cord surrounded by membranes and bone, can be easily prepared and cut. The only disadvantage is that the enamel is not preserved, the action of acids being to remove it before dentine is sufficiently softened.

(c) The sections to be thrown on the screen by means of the projection microscope will, I hope, demonstrate more clearly than verbal descriptions the results of this process. I also pass round a few photomicrographs which I have taken. And here I must express my indebtedness to Dr. F. W. Mott, through whom I have lately had opportunities of working in the Physiological Laboratory of Charing Cross Hospital Medical School.

Slide No 1 is a transverse section of a canine tooth with pulp *in situ*. It will be seen that there is no shrinkage of the soft tissues, the capillary arterioles and veins retain their normal circular shape, while the layers of odontoblasts are strikingly shown. Their processes are seen extending into the dentinal tubuli in a manner compared by Tomes to "harp-strings." It is also observed that their dentinal extremities are placed in a line continuous with that of the tubule. These cells are separated from each other, as I have pointed out elsewhere,* by wide visible spaces, which in a young growing tooth are filled with a homogeneous substance and small round cells. This is best demonstrated in embryonic dentine organs. In older specimens, those dento-genetic cells have disappeared from the periphery of the pulp, although they still remain in enormous numbers in its centre, for the production, if need be, of secondary dentine. The fibrillated

masses, here seen, show the initial stages of the formation of secondary dentine.

Slide No. 2 is a longitudinal section of a canine. Here the capillaries are cut in a longitudinal manner, and the nerve bundles are seen running alongside the blood vessels.

The third slide is a longitudinal section of a temporary canine.

The next slide shows a portion of normal periosteum attached to the cementum.

The fifth slide presents a vascular canal, containing afferent artery and efferent vein blocked by a thrombus passing from the pulp through dentine to cementum.

Slide No. 6 is most instructive. The section was taken from an aged canine, and shows in a remarkable manner a fibroid degeneration of the pulp. It is interesting to note that the normal tissues have disappeared. Thus there are no capillaries, no nerves, and no odontoblasts. The penetration of the dentine by the fibres is clearly seen, and in this respect supports the new theory of dentogeny propounded by Mr. Mummery.

In the transverse section it is curious to observe how the centre is occupied by a chain of large areolar circular spaces, which on first sight are blood-vessels cut transversely. This is not so, however, as they possess no definite vessel walls. The recession of the tissues from one edge of dentine is not produced by the method of preparation, but by the fibroid contraction of the pulp, prior to manipulative interference.

The next slide is a longitudinal section of a tooth sent to me by Mr. Holford. It was perfectly sound to all appearances, but frightful neuralgia led to its extraction with several others. It is of great interest, as it shows deposits of secondary dentine nodules in the pulp cavity, and demonstrates one of the modes of termination of inflammation of the pulp. The three stages of formation are here beautifully seen—first, the calcification of bundles of fibrous tissue, going on to formation of dentine with tiny interspaces, and finally the hard solid masses, which are here and there adherent to the dentinal walls. In some places a layer of odontoblasts is still seen on the surface of the pulp.

The 9th slide is a section of polypus of the pulp. This is also another termination of inflammation. It very well shows large, granular cells, somewhat square in shape, with

prominent nuclei and nucleoli retained in the meshes of a fibrous tissue. The blood vessels are scanty.

A transverse section through the extremity of a semi-developed bicuspid is now shown on the screen. The pulp is very large, and has but a thin wall of dentine on its surface. The formed but uncalcified layer of dentine beneath the membrana eboris is little, if at all, affected by the decalcifying agents. Observe the small size of the odontoblasts, and the numerous small dentogenetic cells.

A section through an abscess sac, at the apex of the root of a bicuspid, demonstrates very clearly the nature of the connective tissue of its walls, and its mode of attachment to dentine and cementum.

As an example of comparative anatomy the next slide shows sections of the teeth of a hake.

The last section is that of spinal column cut transversely. The cord with its meninges is seen *in situ* in the spinal canal. Externally, bones, ligaments, and masses of muscles can be clearly made out. It has been embedded in celloidin.

The slides that have been exhibited are by no means perfect preparations ; they are merely intended to show a few of the various results obtained by the method. A long experience of preparing, cutting, and staining is necessary before really beautiful sections can be produced. These, however, serve the purposes of illustrating this paper fairly well, and are, I think, of interest.

Gentlemen, in conclusion, let me convey to you my best thanks for your kind attention to my communication, which has, I fear, proved to be far too long, and somewhat tautological ; and allow me to express a hope that not only will future trials lead to satisfactory terminations, but that a decided impetus will be given to original research in the sciences of Dental Anatomy and Pathology.

A MAGNET carried by Newton in a finger ring is said to have been capable of raising 746 grains, or about 250 times its own weight of 3 grains, and to have been much admired in consequence. A magnet formerly belonging to Sir John Leslie, and now in the physical collection at Edinburgh, has still greater power, however, weighing $3\frac{1}{2}$ grains and being, able to support 1,560 grains.

Archives.

A COACH-AND-FOUR THROUGH THE DENTISTS' ACT.*

By H. N. GROVE, L.D.S. WALSALL.

MR. PRESIDENT AND GENTLEMEN,—I am about to show how the proverbial Coach-and-Four is actually driven through the Dentists' Act of 1878 ; not because of any defects in the said legislation, but on account of the apathy and indifference of those in authority and place to deal with the problem of dental practices carried on by unregistered Practitioners.

The Dentists' Act was passed for the protection of the public, but I fear they are taken advantage of at every conceivable opportunity by pseudo-Dentists using such head-lines on advertisements as : "Operative and Mechanical Dentistry," "Painless Dentistry" "Dental Department," etc. Monumental brass plates, doors, and lamps inscribed "The Dental Surgery" or describing their artificial teeth, cocaine, nitrous oxide operations, extractions, stoppings, American systems, etc., thereby conveying to the public the impression that they are bona-fide Dentists. What more can the advertising registered Dentist do ?

In the local Directories they are styled by such names as for instance, Mr. Brayass Pullemout, Dentist, and also classified with registered Practitioners, under the head of "Dentists." An Editor of a weekly paper, having a large circulation describes his visit to a Dentist, who is legally not a Dentist, but a would-be one.

Of course these men say, "I cannot help what canvassers of Directories, or Editors of Newspapers say about me," but there is the other side of the question, they in common with the Public get the impression that these men *are* dentists. I have even met with Medical men, not a few, and members of their families holding the same views, and if you were to poll their locality you would find 99 per cent. describe these unregistered men as "Mr. So-and-So, Dentist." Now all this goes without contradiction because it is impossible for those who could, to give the lie direct, for reasons obvious to you all.

I need not weary you with the details of the malpractices

* Read before the Central Counties Branch of the British Dental Association, December 3, 1891.

perpetrated by these unregistered men, as I know some of you here are personally acquainted with cases of this description, and which I trust will be ventilated during the discussion which will follow this paper.

You will notice that I have quoted and exhibited copies of advertisements from Newspapers, Circulars and Pamphlets. Look at the headings ; "Painless dentistry," Dental Department," "Operative and Mechanical Dentistry," etc. Doors, Plates and Lamps inscribed "The Dental Surgery." I now submit a quotation from a letter in the handwriting of a pseudo-Dentist to a patient which runs thus : My Dental Assistant shall wait on you at your own residence to take the impression," etc. Here is an implied description expressed by letter, thereby contravening Section 3 of the Dentists' Act. Perhaps it will be well for me to read this Section.

"From and after the 1st of August, 1879, a person shall not be entitled to take or use the name or title of 'Dentist,' (either alone or in combination with any other word or words) or of 'Dental Practitioner,' or any name, title, addition, or description implying that he is registered under this Act, or that he is a person specially qualified to practise Dentistry, unless he is registered under this Act."

"It is hereby declared that the words 'title, addition or description,' where used in the Dentists' Act, 1878, include any title, addition to a name, designation or description, whether expressed in words or by letters, or partly in one way and partly in the other."

"Any person who, after the first day of August, 1879, not being registered under this Act, takes or uses any such name, title, addition, or description as aforesaid, shall be liable, upon summary conviction, to a fine not exceeding £20, provided that nothing in this Section shall apply to legally qualified Medical Practitioners."

If this Section does not checkmate the aforementioned irregularities, I have yet to learn how the Queen's English could have been worded more effectually to foil and frustrate such knavish machinations. This completes the Drive.

Now, gentlemen, for my plan of Campaign, in which I will endeavour to show you how the Coach-and-four could be upset.

In the first place, it is too much to expect that the heat and burden of the fray should be borne by the executive of this Association (Gentlemen who have served their profession

right nobly and well, by untiring and unselfish devotion to its interests.)

I would suggest that a small band of earnest, enthusiastic workers be formed into a Vigilance Committee, with a paid Secretary, the latter to devote his whole time to the interests of the profession, and the upsetting of the Coach, to travel and collect material for an organised onslaught without fear or favour, to win or lose in all cases of illegal practices. I think the following Syllabus should guide us, subject to alteration :

1. To check all irregularities.
2. To institute prosecutions in all instances where such implied designations or descriptions are made use of, such as those enumerated in the commencement of this paper.*
3. To lend assistance to the unwary to recover monies paid to illegal practitioners for useless work, and to sue for damages for bungling operations.
4. To use every available means to obtain full publicity in the press of all cases of prosecution, and where possible to get Leaders or Leaderettes on the subject inserted in the papers.
5. A judicious distribution of literature (particularly in districts where these parasites infest) as to the best manner of preserving the Teeth, and, at the same time, concisely explaining the difference between a legal Dentist and a mere adventurer.
6. A Black Book in which advertisements and all cases of malpractice reported to head-quarters should be fully recorded, similar to the one I have here, from which I will read a few entries.

The fact is, gentlemen, the Act is good : but requires a bolder and more vigorous application. If the battle is not fought and won during the present generation, the Dentists Act of 1878 will become much less powerful than it now is, for you must know if these practices are allowed to go on for years, without suppression, time alone will lend sanction to them and establish vested interests, which our legislators always doggedly, and very properly guard.

Let us take another Act :—I refer to the Apothecaries' Act. A few years ago the Society of Apothecaries sought to restrain Chemists from prescribing for simple ailments over their

* To point out definite titles would be actionable if those using them happened to be registered. So they are omitted.—Ed., B. J. D. Sc.

counters ; the test case was the Society of Apothecaries v. Shepperley of Nottingham ; it was won by the Chemist, who proved in Court by the testimony of the oldest members of his craft that such had been the custom from time immemorial, and it was ruled by the Judge that counter-prescribing was lawfully within the Chemist's right.

You have only to imagine in course of time similar action under our Act being frustrated by virtue of long-continued custom.

I have yet another Act to quote :—I refer to the Pharmacy Act, which made it unlawful for an unqualified man to sell or dispense poisons. And the case I now quote is the Pharmaceutical Society v. Wheeldon. A poison was sold at a qualified Chemist's by an unqualified assistant to an individual who shuffled off this mortal coil and the Coroner insisted upon the Pharmaceutical Society of Great Britain suing for a penalty, which they reluctantly, though successfully did. Notice of appeal was given, and the case carried to the Higher Courts, but the judgment was confirmed, and with what result, gentlemen ? The Pharmacy Act which was growled and grumbled at by qualified Chemists, proved to be a huge monopoly, and had the effect of increasing the market value of the Pharmacist's Diploma at least 50% ; but this is not all it did. Before the decision, the qualified Chemist could have branches without limit to number, carried on by unqualified men. But not so now ! At present a member of our profession may have any number of branches, worked by unregistered men. Methinks I see Section 3 of our Dentists' Act, if energetically enforced, sufficiently powerful to compel each practice or branch to be conducted by a registered man, and since the act was passed for the protection of the public, it seems against common sense for our Judges not to enforce it.

Yet stay ! I have another Act to quote, the Medical Act. You have only recently had experience in the case of Dr.—who, although a qualified Medical Practitioner, was hounded out of the place because he had a number of branches worked by unqualified men. The result was shown by a letter from the Doctor's wife, which appeared in the *Mail* only a few weeks ago, stating that she had closed the branches, and engaged a qualified man. Since writing this paper the Doctor's name has been removed from the register by the Medical Council. Recollect, gentlemen, the Pharmacy Act was passed in 1868, the Dentists' Act in 1878, and the kernel of

the 1868 Act was only revealed, so recently as 18 months ago. Do not let us take the same length of time to crack the nut and discover the kernel of the Dentists' Act of 1878.

Let me just briefly refer to one more Act: The New Zealand Dentists' Act. The New Zealand Dental Association believed that their Act was faulty and incomplete in its wording, and could be evaded, making it impossible to obtain a conviction, so-called eminent legal opinion was taken. After a considerable period, during which caution grew into timidity, the following happened. A Dental Student smarting under a deep sense of the injustice of a man practising without any legal qualification whatever, instituted a prosecution solely on his own responsibility, with the result that the defendant was fined £5 with costs, this occurred so recently as March 6th of last year.

Your present leaders show their activity, zeal and vigour in dealing with men who contravene the Act by the following procedure:

They most solemnly deliberate before taking action against an unregistered man even when he admits that he is Mr. So-and-So the Dentist, in the hearing and presence of a second person, and they still more solemnly deliberate should a third individual overhear the damaging accusation. Now, Gentlemen, I appeal to you. Ought we to wait for such self-conviction? You know that it only requires a very moderate amount of intelligence to steer clear of such incrimination. I am an advocate for bolder methods, and, to show my earnestness, I am prepared to subscribe £25 to start a Vigilance Fund, under the auspices of the British Dental Association, if 19 others will subscribe the same:—result, £500 to commence with.

This, Gentlemen, completes my plan of Campaign.

I have elaborated an inner circle Plan of Campaign, but think it would be premature to discuss the same at present.

Brother Dentists, Students (Future Dentists), you alone have the power; insist that your leaders be earnest, energetic, and above all, determined men; let your representatives in the Dental Parliament be sworn to look after your interests on the loaves and fishes side of the profession, as they have done on the educational. They have given you a splendid Act of Parliament, for which tender them your best thanks, but the M.R.C.S. and the L.D.S. qualifications will not maintain you,

You will notice in this paper, that I lay great stress upon the fact that your leaders have only tested the Act on narrow

lines, as in the "Wisbech Case," when two Surveyor's Clerks were sent to a man and asked him "are you a Dentist?" they stated that he replied "yes," that was the sole evidence, the man never used any of the titles, descriptions or designations here shown.

That, Gentlemen, was the case which disheartened your leaders and the reason why the Act has not been enforced.

Put my "Plan of Campaign" to the test and time and events alone will prove whether my interpretation of the Act, or that of our London friends be correct.

Remember, gentlemen, that present practitioners only feel in an infinitesimal degree, the divergence of what should be the back-bone of your practices. I allude to Dental Mechanics. In a few years, when the number of unregistered men has increased, as in the natural order of things it will do, you then become simply operators. What does it matter if 99 prosecutions fail, so that ultimately you win. Fight, without counting defeats! You have a just cause. Do not let the next generation say how short-sighted their predecessors were, and remember, always remember, that God helps those who help themselves.

TO CLEAN WAX.

Get any old tin or skillet, put all your waste bits of wax, cast from artificial teeth into it, put a couple of inches of water into keep the wax from burning, boil till all the wax is melted, then pour a pint of hot or boiling water into a washbowl or other suitable vessel, empty the contents of the skillet into this and let it stand till next morning. All the sediment will have gone to the bottom. Scrape this off, and should the wax not be clean enough, repeat the same process, only this time add a teaspoonful of sulphuric acid to the melted wax before pouring; this will make the wax clean and yellow, as when first made by the bees. It will not do to pour it into cold or even warm water, it must be either hot or boiling. If the above directions are carefully followed, there is no wax so dirty but what may be made just as good as ever. Wax can be toughened by adding either resin, Burgundy pitch, or, what is better, Venice turpentine. Dr. D. V. BEACOCK.

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A LEGAL OPINION ON NON-REGISTERED DEGREES.

A case of some interest has recently been decided before the Lord Chief Justice in reference to the use of a degree which could not be registered under the Medical Act. The ruling of his lordship was very clear, and, as we think, just on this point. The defendant was registered on the strength of an L.S.A. diploma, and so was entitled to practice, but was not free to describe himself as "M.D." unless he possessed a degree from a university recognized by this Act. In this case the degree happened to come from Indianapolis; but this point is immaterial, the main fact being that unless a man has a degree which can be registered he has no right at all to use it. By general usage a medical man is allowed to be known as the "Doctor," often, it is true, a misapplication of the term, both in its academical and in its literal sense, but though a man can hardly be expected to correct others, if they choose to give him a title he does not possess, it is clearly quite a coat of another colour if he himself assumes what he is not entitled to. Unfortunately, it is the custom in the United States for Dental Surgeons to call themselves "Doctors." So prevalent is this that the veriest hobbadehoy, who is but a student of a few weeks' standing, is "Doctor" not only to his fellow students but also to the professors at his college. Clearly this is turning the whole thing from the sublime to the ridiculous. To be a "Doctor," in the true sense of the term, is a thing to be proud of, whatever be the branch of learning in which the distinction is

earned, but to drag it into the mire in this way is to absolutely rob it of all the value it possesses. Truly it is meet that we put our own house in order before attending to the business of other folks, and so we may say at once that what they do in the States is no concern of ours, and we would only in passing remark that it must not be taken that this rule has called forth no protests in that country, for it has, though, so far, without results. But if a man goes to Rome, it is, at any rate, polite for him to do as Rome does. Dentistry, with us, is looked at as a branch of Surgery. Now it is the custom for Surgeons to drop the title "Doctor" even though they may possess the very highest Doctorate of the most distinguished University, and if they do so, surely it is better that we should do so also even though we may possess a legal right to its use. And, if this be so, how much less should we use it if we do not possess this right. A few minutes' reflection will suffice to recall that those English practitioners of dentistry who possess the higher degrees do not attempt to use the title though, alas! here and there, may be found a little minded man with some inferior degree blazing away with his doctorate to the amusement of all. Now, if English dentists follow this line of action, professional feeling should be sufficiently strong amongst those foreign graduates, who come to dwell amongst us, to induce them to follow in the well established etiquette. Unfortunately, it is often not so, and, in a sense, we have but ourselves to blame, for instead of ignoring the "Doctor" and using the "Mister" a natural sense of politeness somehow or other, makes one call a man, as he would be called, rather than as we would he should. All this is, however, perfectly legal, but quite otherwise is it with a vast number who flourish their D.D.S. Turning to the register we find there are but 14 foreign practitioners in England who possess a foreign diploma, which can be registered here. Now let us apply the Lord Chief Justice's ruling to all the others, and they are not a few, who decorate their doorplates with titles which are not legal. They use a title from a College which has no *locus standi*, but they do not add that it is from this

College. On the contrary, simply D.D.S. is placed implying, according to this ruling, that it is from a College which is recognized. But we have stated that it is not. Now, even though he may be registered on some other qualification, the words of Lord Coleridge are :—it was a monstrous contention that because the gentleman was registered under the Act as one thing, he would call himself anything else for which he was not registered.” How much more monstrous it is that he can so call himself if he have no recognised diploma at all. Yet we fancy,—would it were only fancy,—that it would not be very difficult to find a good many such. Alas ! the thing goes on with impunity. It is nobody’s business, we suppose. We have an association, which, it is understood, sees to these things, but perhaps it is too busy moving heaven and earth to attack “covering” which as yet it is not able to do, neglecting that which can be done. Covering is very shocking, we know, and we rejoice with all that the matter was brought before the Medical Council, even though the direct representatives left doing so till they were about to appear before their electorate. We hope with all that, the Association will get the powers it needs, but what will they do then ? Is it another wind bag which will soar away heavenward, expanding as it goes and then, having reached its goal somewhere above the clouds, and then ?—— Well ! some, reading past history, fancy it will burst and be gathered to its fathers, the other dead letters of the Dental Act.

PURIFICATION OF THE ROYAL COLLEGE OF SURGEONS.—The English Royal College of Surgeons has undergone a thorough purification ; we do not mean of its old ideas, but of its sanitary arrangements, the old drains have been removed and modern ones have been substituted under the direction of Mr. Salter : now Fellows and members can enjoy the Library and museum without any fear of having a personal experience of typhoid fever, now so prevalent.

University College Hospital has just received the nice little sum of £15,000 from the County Council for the sale of the portion of Gower Street, in front of the Hospital, which, as most of our readers will know, was closed to vehicular traffic. Noiseless pavement will be put down, and the money it is said will be spent in extending the Hospital.

A curious story is told of a reply to a question of Prof. Cheine's of the Edinburgh University. After giving a demonstration, said he to a member of his class, "Now, sir, can you tell me what is wrong with my dressing?" The ingenious youth turned red, and preserved a discreet silence. Mr. Chiene, however, was not to be put off, and repeated the question. After a long pause the youth stammered out in a fit of desperation: "Well, sir, if you insist on my telling you, I should say your tie is not quite straight."

A countryman presented himself to have a tooth extracted and was seen by the assistant, who unfortunately pulled out the adjacent sound one as well. The poor countryman nearly fainted with the pain, and when he recovered his speech gave it to the unskilful operator hot and strong. "Hush," retorted the apprentice, dreading his employer's wrath; "if master gets to know that I have extracted a couple of teeth, he'll charge you double." The patient took the hint and his departure without further complaint.

As a preventative of the unhappy action which cocaine sometimes has when injected, Dr. Cockburn Smith proposes to prepare the patients by giving them a drop of a 1 per cent. alcoholic solution of trinitrine a minute before administering the cocaine, repeating the dose at intervals if the pulse be not affected and no pain or fulness in the temporal region be

felt. The trinitrine acts, he says, almost as rapidly as, and continues to affect the vaso-dilators for upwards of half an hour longer than nitrite of amyl, which Professor Lépine has proposed, but which, on account of its fleeting action, has failed to gratify the hopes to which it gave rise.

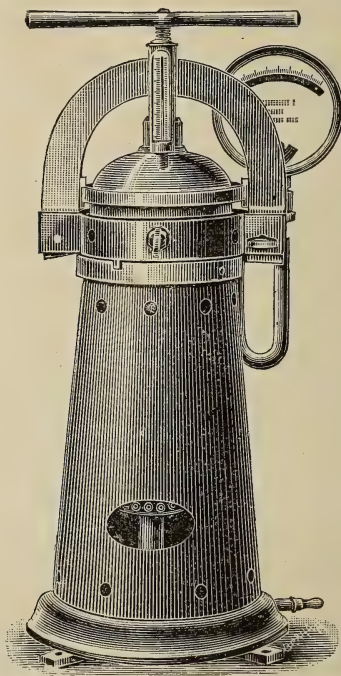
Another case of swallowing an artificial denture is put upon record by Dr. Rozenzweig of Malmesburg, Cape of Good Hope. It happened during an after dinner nap from which the patient suddenly woke with an intense suffocating feeling, with acute pain in the throat. As his false teeth could not be found, and he was positive they had been in their accustomed place when he had fallen asleep, he supposed he had swallowed them. Solids and liquids could be swallowed freely and without pain. A sponge probang passed easily into the stomach. The patient was put to bed, enjoined strict rest, and the ordinary diet in such cases prescribed. For the next three or four days there were severe cramp-like pains, especially over the hypogastrium ; no marked tenderness, constipation alternating with diarrhoea, and the stools contained little faecal matter and much mucus. There was no tenesmus or blood passed. A long rectal bougie failed to detect anything. About the fifth day matters improved, the bowels moved regularly, and the motions were normal in every respect, and continued so for the next six weeks. About the third week the treatment proved too monotonous, the patient got up and partook freely. Shortly after this, after a long drive, he was seized with severe abdominal pains, and the teeth and plate passed seven weeks after having been swallowed. The teeth stuck at the anus ; and were forcibly torn out, occasioning free hæmorrhage. Two large abscesses subsequently formed on either side of the anus. Both have healed. The teeth were attached to a gold plate, the whole measuring, in its longest diameter, $2\frac{1}{4}$ inches, in its shortest $1\frac{1}{4}$ inch, and its greatest breadth was $\frac{3}{4}$ inch.

Manipulative Miscellany.

All new instruments or articles that it is wished to have described under this heading, are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

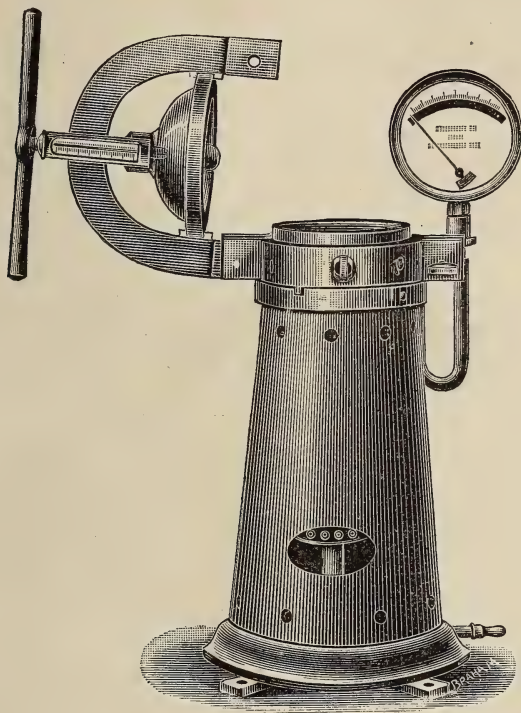
RUTTERFORD'S PATENT VULCANIZER.

The engravings give a very fair idea of the advantages claimed for this machine, its special improvement is in the



manner of placing the lid in position, and removal instead of the unscrewing of the centre screw and after taking away

the lid as in the ordinary way, it is attached to, rises and is thrown back with it. Its further being controlled by slots at the side (ensuring it being sent home always in identically the same place,) considerably facilitates its being kept steam tight. The boiler itself is of copper $\frac{1}{4}$ inch thick, and instead of the ordinary side-screw the bridge is held in position by



bolts; the safety valves is an arrangement by means of which a very thin copper disc is blown out in the event of the temperature reaching 380 or by substituting a thicker or thinner piece of this copper at any desired temperature. The machine certainly strikes one as combining strength with simplicity. One illustration represents the lid closed, the other with it turned back.

OWERT'S MOUTH-MIRROR.

The construction of this mirror is sufficiently explained by the accompanying illustrations. It is intended to meet those cases where the dentist wishes both hands free for the manipu-



lative details of his work. Instead of having to devote one hand to holding the mirror, this is fixed in position by a pad on the chin and straps round the head.

Abstracts of British & Foreign Journals.

ELECTRICITY AS A THERAPEUTIC AGENT IN THE TREATMENT OF HYPERÆMIA AND CONGESTION OF THE PULP AND PERIDONTAL MEMBRANE.

By JOHN S. MARSHALL, M.D.

I have chosen as the special topic of this paper two out of several important pathological conditions of the teeth to which the various forms of treatment by electricity may be beneficially applied. The choice has been governed by a desire to present forms of disease upon which these beneficial results could be most easily and certainly demonstrated.

Hyperæmia and congestion of the dental pulp from caries, thermal shock, chemical and mechanical irritants, and traumatic injuries, etc., resulting in odontalgia, are among the most common of the diseased conditions found in the oral cavity,

and many times the most difficult to control by the methods of treatment usually adopted, without devitalization of the pulp. Hypermia and congestion of the peridental membrane from constitutional causes, such as rheumatism, gout, and pregnancy, and certain local causes, like excessive malleting, undue wedging, change of position of the teeth in regulating and other surgical or traumatic injuries, resulting in severe pain, is many times quite as difficult to control.

These forms of disease will best serve our purpose in this attempt to demonstrate the therapeutic value of electric and galvanic currents in the treatment of local disorders of the oral cavity.

The object of course, in the treatment of these forms of disease is, in the first class, to relieve the congested condition of the bloodvessels and to preserve the vitality of the pulp; in the other, to arrest the inflammatory symptoms short of the suppurative process or of the formation of adventitious tissue or new growths.

It is a generally-known fact to medical electricians that local hyperæmia and anæmia can be produced at will by the influence of the negative and positive currents of electricity and that resorted to certain inflammatory products and new growths can be promoted through their stimulating effect upon the absorbent organs.

It was the knowledge of these facts which led me to investigate the value of the application of these principles to the treatment of congested conditions of the dental pulp and peridental membrane.

The first case upon which I attempted to demonstrate these principles (which will serve as a good illustration) was a tooth in my own mouth, the history of which is as follows: The right first superior bicuspid had been filled with gold at the age of twenty years, but from poor manipulation had been re-filled several times during the next fourteen years. Ten years ago the last of these fillings came out, leaving a large disto-approximal cavity, and the pulp nearly exposed. The tooth was exceedingly sensitive to the slightest thermal changes, to acids or sweets; it was therefore plugged with Hill's stopping. Six years ago this filling was removed with the hope of introducing gold, but the tooth was in such a sensitive condition as to make it unwise to introduce a gold plug; oxyphosphate cement was therefore submitted. During the following night there were developed marked evidences

of a congested condition of the pulp. The next morning the phosphate filling was removed and the cavity dressed with oil of cloves, and a solution of gutta-percha in chloroform was flowed over the bottom of the cavity and refilled with oxy-phosphate cement. The symptoms, however, did not abate, but gradually increased in severity. I therefore determined to try the depleting effect of the positive galvanic current, and called upon my friend, Dr. Justin Hays of Chicago, with the request that this line of treatment might be thoroughly tried. The positive pole of the continuous galvanic current was applied to the tooth, and the negative pole to the carotid triangle of the neck on the same side. The strength of the current was graduated to my ability to bear it without discomfort, and the poles were allowed to remain in position about half an hour. At the end of ten minutes there was a marked improvement in the symptoms, and at the end of the half-hour all discomfort in the tooth had disappeared. During the following night the tooth again became uneasy, but a second treatment of about twenty minutes the next morning completely relieved it, and from that time on it has caused me no annoyance. Three years ago the tooth was filled with gold, as a clinic by Dr. Roscoe F. Ludwig, at the International Medical Congress held at Washington, D. C. The pulp is still vital, but is no more susceptible to irritating influences than that of any other tooth in my mouth.

The marked success which followed the treatment of this tooth has led me to adopt the same treatment in several similar cases, all but one of which have responded to my entire satisfaction. This case was one in which there was not much hope of the treatment proving successful, yet it was tried as a forlorn hope. The history is briefly as follows; Miss J. E., aged twenty, of frail, delicate organization, fair health, had been under treatment one year previously for protrusion of the superior anterior teeth. The operation had been performed slowly and with great care to avoid serious irritation of the dental tissues and alveolar processes, and the final retaining-plates had been worn for about six months. About this time a slight discoloration near the gum of the right superior central was discovered. She came in haste to know why this should occur. There had been no pain in the tooth, and there was no soreness to percussion; it was slightly sensitive to heat and cold, but this symptom was not so marked as in the adjoining teeth. My diagnosis was either passive congestion

of the pulp, induced by the irritation in moving the teeth, or the formation of an embolus in the pulp vessels. Which it was, I was unable to decide, and as there seemed no hope of saving the vitality of the pulp by the ordinary methods of treatment, the positive galvanic current was applied. In the treatment of this case I called in council Dr. Plymon Hayes, of Chicago. On the application of the current to the neighbouring teeth, three-fourths of a milliampere was all that could be comfortably borne, while the diseased tooth would bear just double this amount. Daily treatments of twenty minutes each were maintained for a week; during the first three days there was a slight increase in the sensation of the tooth under the current, and the strength was reduced to one milliampere; after this, however, sensation seemed to grow gradually less, the current being increased to three milliamperes without unpleasant response. The treatment abandoned the tooth tapped, and the pulp removed, and the case treated by the usual methods.

In the treatment of pericementitis not caused by septic poisoning from a devitalized pulp, it is many times of very great benefit. In these cases the positive pole should be applied to the gum over the roots of the affected tooth; marked relief is often experienced in a few minutes, and often entirely relieved after three or four applications.

In a former paper I have called attention to the prevalence of hyperæmic odontalgia frequently accompanying pregnancy as a result of impeded circulation in the lower extremities and thereby causing general hyperæmia of the upper half of the body. The general treatment suggested in that class of cases was rest in the recumbent position, and anodynes. I would now suggest as an additional treatment the local application of the positive galvanic current to the affected teeth.

With regard to the strength of the current, experience proves that from three-fourths to one and a half milliamperes is sufficient in the class of cases so far mentioned, while the frequency of the sittings will depend on the severity of the local symptoms and the nervous susceptibility of the individual.

As a rule, one treatment in twentyfour hours is all that will be required; in aggravated cases two, and occasionally three may be advisable, the duration of the sittings being from fifteen to thirty minutes.

As a means of diagnosis in obscure cases of the vitality or

nonvitality of the dental pulp, I know of nothing so sure to demonstrate to a positive certainty these conditions as the electrical currents, both the galvanic and the faradic. In the more obscure cases, however, the faradic is superior to the galvanic, for if there is the slightest vitality remaining in the pulp it will demonstrate it instantly by causing a response in the tooth. It is superior in this respect to the transmission of light by the electric mouth-lamp, for many times when the condition is upon the border-line between the life and death of the pulp, the electric light fails to satisfactorily demonstrate the condition.

I also believe that the electric currents will serve to demonstrate the presence of low grades of inflammation of the tooth-pulp, so often the cause of various forms of neuralgic conditions of the face and head. The faradic current especially, if applied in such cases, will demonstrate a hypersensitive condition of the the tooth pulp. In order to locate the tooth causing the neuralgia, it will be necessary to apply the current to each individual tooth. The diseased one will give more active response to the current than will the healthy teeth: in other words, the diseased tooth will not bear so strong a current as will the healthy ones, hence the importance of using the milliamperameter for measuring the exact strength of the current.

The value of the current in the treatment of neuralgia, paralysis, atrophy of muscles, chronic indurations, tumors, and various other conditions there is not time to detail. We shall therefore leave the matter here, feeling that we have offered a sufficient number of suggestions to stimulate investigations as to the value of electro—therapeutic treatment in the class of cases which have formed the especial topic of this paper.

Reports of Societies.

MANCHESTER ODONTOLOGICAL SOCIETY.

THE usual monthly meeting of the above Society took place on Tuesday, November 3, at the Grand Hotel, Manchester, the President, (Mr. I. Renshaw), being in the chair.

ELECTION OF NEW MEMBERS.

Mr. David Headridge, of Manchester, and Mr. W. R.

Birkett, of Warrington, were elected members of the Society.

DISCUSSION.

The discussion on Mr. Wilson's paper was opened by Mr. E. P. Collett, who read a letter from Dr. P. Shaw, referring to a death which had occurred in a London Hospital, and which was supposed to have been due to chloroform. Mr. Collett added that Dr. Shaw, when in America many years ago, made a number of experiments on animals with chloroform, and the conclusion he then came to was that death was not so much due to heart trouble as to the interference with the respiration.

Mr. G. G. CAMPION said he thought they were all indebted to Mr. Wilson for his really admirable paper. There were one or two points which occurred to him as the paper was being read, and which he should like to refer to. The first was in regard to what Mr. Wilson said about cocaine. Mr. Wilson had said that sometimes the injection of cocaine aggravated the existing pain in inflamed tissues. But he did not say, possibly it was a chance omission, that in many of these cases the anæsthetic had no effect at all. Many of those present would probably have noticed that when using it for the extraction of teeth where there was considerable periodontal inflammation, the cocaine when injected gave a good deal of pain, but its anæsthetic effect was nil. Again, Mr. Wilson said in connection with nitrous oxide, that there was no means at present of extending its administration during dental operations, and that that was one of the objections to its use in some cases. A few months ago, he (Mr. Campion) saw an arrangement for doing this. The idea was originated, he believed, by Mr. Coxon, a dentist, at Wisbeach. He used a metal tube connected by a flexible tube to a gasometer. Then whilst the operation was in progress he placed the metal tube in the patient's mouth, and forcing through it a stream of nitrous oxide he practically made the patient breathe nitrous oxide whilst the operation was proceeding. By this means he claimed to extend the period of anæsthesia for some minutes, and so enable more work to be done. With regard to the mixture of nitrous oxide and ether, he could cordially add his testimony to what Mr. Wilson had told them. He had had the pleasure of personally experiencing its administration at Mr. Wilson's hands. The time occupied in bringing about anæsthesia was very short and there were,

in his case, no disagreeable sensations whatever, nor was he sick on recovering consciousness.

Mr. HOOTON congratulated the society on its good fortune in securing a specialist like Mr. Wilson, to address them on anæsthetics, and referred to the fact that in Manchester now, as had been the case for some time in London, the services of expert anæsthetists were available. He said that it did not always happen that even an experienced general practitioner was a good anæsthetist, and related a case of a patient who went to have a number of stumps removed, accompanied by his medical attendant, who was to administer ether. For some reason or other, he had not taken an inhaler with him, so a cloth was used instead. As the ether was spilt about quite freely, the operator and the surgeon got a good share too. After some time the patient who was hitherto perfectly quiet, heard the surgeon say that he was "under," when he suddenly sat bolt upright, put his hand into his pocket and pulling out his watch, made a remark about the time. The supply of ether having given out, it was decided to fall back on nitrous oxide, and several of the stumps were removed, the rest being left for a future operation, to the great disappointment of the patient. In cases, therefore, requiring ether or chloroform, he thought it very desirable that the anæsthetic should be given by an operating surgeon or by an experienced anæsthetist.

Dr. WHEELDON said he thought Mr. Wilson had been a little hard on chloroform. He had had cases where patients had suffered so much from vomiting after the administration of ether, that they had begged him to use chloroform.

Mr. COLLETT said he would like Mr. Wilson to tell them what he could about the new chloroform which was being manufactured at Warrington, and used largely at the Infirmary, and which the public had got to believe had caused a number of deaths. The manufacturer had told him, (Mr. Collett) that he could guarantee his chloroform to be of a constant specific gravity while that manufactured at Edinburgh varied considerably. He thought that deaths due to the administration of nitrous oxide were not due to the anæsthetic, but to foreign bodies. He quite agreed with Mr. Campion about the effect of cocaine where inflammation existed. There was no hard and fast rule as to the quantity of cocaine to be used. He was glad Mr. Wilson did not consider it as safe as nitrous oxide. From an experience he had when once using cocaine he had come to the conclusion never to use it again.

Mr. SIMMS said that Mr. Wilson rather discounted the advantage of nitrous oxide gas with children. His (Mr. Simms,) experience had been so favourable with children in using the gas, that he should be glad if Mr. Wilson would give them the reasons for his statement. Speaking from memory he thought there had never been a single death amongst children which was due to nitrous oxide. Children, as a rule, took it easily, and remained under its effect long enough to enable the operator to extract from one to four teeth.

Mr. WHITTAKER said that in regard to anæmic people, he found that a very small dose was sufficient to place them deeply under the influence of gas. He might also say that he had given up the use of cocaine.

The PRESIDENT said they were all much indebted to Mr. Wilson for his excellent paper. In his own experience of cocaine he had had on the whole good results, but in several cases, particulars, of which the President gave, temporary ill effects had followed its use.

Mr. WILSON in his reply, referring to Dr. Shaw's letter, said it was important in administering anæsthetics, that the patient should be calm and collected. He pointed out as a curious and interesting fact, that only in chloroform cases was death ever attributed to fright. Patients however, got quite as frightened with ether, gas, and other anæsthetics, (as frightened as they can be) which together were used, more extensively than chloroform, and deaths rarely happened with these it was evident that in the so-called deaths from fear, the chloroform must contribute largely to the fatal result. In phthisical patients, as noticed by Braine the narcosis appears to deepen after removal of the face-piece. Regarding children, he always had in view the necessity of retaining their confidence by every possible means; for this reason he advocated giving gas and ether rather than risk giving them pain, as they might do with gas alone.

As between ether and chloroform his preference was decidedly for ether, given as it should be, combined with nitrous oxide. At the same time, he fully appreciated all the advantages of chloroform, which he still largely used, and by no means wished to unduly depreciate it. Both anæsthetics caused sickness, in the case of ether it was sooner over, and more amenable to treatment than when the chloroform was used. Mr. Wilson disclaimed any intention of being

“unduly hard” upon chloroform. As regards the Warrington chloroform, it was most unfortunate that a prejudice against it had been unjustly created. Of the five fatal cases attributed to it, only two were deaths from chloroform, and these could in no way be traced to any peculiarity in the drug. He had himself given it to some 800 cases and was quite satisfied with its action. It was no doubt a pure chloroform, and there was always the possibility that the method employed in its manufacture might prove to be superior to, and supplant those in general use. He would have no hesitation in administering Warrington chloroform.

The cordial thanks of the meeting were accorded to Mr. Wilson for his valuable paper, on the motion of the President seconded by Mr. William Headridge.

Reviews.

MR. FRANCIS LEPPER'S Catalogue.—Mr. Lepper sends us a copy of the new edition of his catalogue which, he says, will be sent to any dentist on application.

BURDETTS HOSPITAL ANNUAL FOR 1891-2.—This book deals in an exhaustive manner with the subject of Hospitals, their incomes and expenditure and general management, and with all that pertains to the training and work of nurses. To these it must be of great value, whilst all interested in Hospitals will read it with pleasure.

DISCUSSION ON ANÆSTHETICS. Edited by J. Walker Downie. This is a reprint from the *Glasgow Medical Journal* of an important discussion on this subject which took place in the Medico-Chirurgical Society of Glasgow last October. The discussion was opened by Dr. W. Macewan, and maintained by some of the Society's most distinguished members, and can be read with great interest, giving expression as it does to the various views, which are held on the action and uses of these valuable therapeutic agents.

GOLDEN RULES OF SURGICAL PRACTICE. By a Hospital Surgeon. Published by John Wright and Co., of Bristol.

Golden Rules these are, which are given in the little booklet before us, and the student or young practitioner with these in his mind would save many a mistake.

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